DOCUMENT RESUME

ED 439 589 EF 005 652

TITLE	Maintenance Matters: Maintenance and Minor Works in Primary Schools. A Manual for Boards of Management.
INSTITUTION	Department of Education and Science, Dublin (Ireland).
PUB DATE	1998-06-00
NOTE	213p.; Colored photographs may not reproduce clearly.
PUB TYPE	Guides - Non-Classroom (055)
EDRS PRICE	MF01/PC09 Plus Postage.
DESCRIPTORS	Elementary Education; *Elementary Schools; Foreign Countries; *Guidelines; Planning; *School Maintenance
IDENTIFIERS	*Building Maintenance; Ireland; Regulatory Programs

ABSTRACT

This manual provides guidance in the maintenance requirements of primary education schools in Ireland, covering: roofing; floors and walls; doors and windows; external and internal finishes; heating, plumbing, and drainage; electrical installations; paved and grassed surfaces; and furniture and loose equipment. The basic considerations are covered for each area followed by a list of the types of problems encountered, why these problems arise, and tips for maintenance surveillance. Also included is advice on work planning covering applications, appointing consultants and contractors, and key points on health and safety regulations. An appendix contains grant regulations for minor works to national schools, and maintenance checklist sample forms. (GR)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 439 589

MAINTENANCE MATTERS

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
Tom Plunkett
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA | DEPARTMENT OF EDUCATION AND SCIENCE

BEST COPY AVAILABLE

Maintenance and Minor Works in Primary Schools

A Manual for Boards of Management

EF 005652

BEST COPY AVAILABLE

Credits

Authors: **Coll & McCarthy, Architects**
Original line drawings: **Dawn Richards, Coll & McCarthy, Architects**

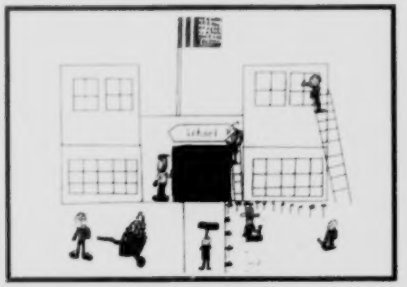
Designed by: **Brian Kelly Design Associates**
Printed by: **Brookfield Printers**

This publication was prepared in conjunction with the technical and administrative staff of the Planning and Building Unit of the Department of Education and Science, Tullamore, Co. Offaly.

IRELAND

Orla Dunne

Mandy Flynn



Cormac Flynn

The artwork used on the cover, inside cover and section dividers of this manual was chosen from an art project carried out by the pupils at St. Colman's N.S., Mucklagh, Co. Offaly.

BEST COPY AVAILABLE

Foreword

I warmly welcome this publication which covers the important work of caring for school buildings and facilities. I have no doubt that it will become an invaluable reference manual for schools throughout the country.

The publication of the manual is timely. We live in a era when property-owners everywhere have become increasingly conscious of the importance of routine maintenance, and of the fact that deferred maintenance is a false economy. Those messages are reinforced throughout the manual. Furthermore, the publication comes at a time when finance, authority and responsibility for minor improvement works at national schools have been devolved to the schools under the Devolved Minor Grants Scheme which came into operation in 1997.

I know that a lot of work has gone into the preparation of the manual and I commend those responsible. Considerable attention was paid to "user friendly" language and descriptions and I welcome that approach. I know also that a number of schools assisted in the drafting work and I thank them sincerely for their invaluable input. A special word of thanks is due to the pupils of St. Colman's National School in Mucklagh, Co. Offaly who provided us with some of the artwork.

In visiting schools around the country, I am enormously impressed by the work carried out by school management in maintaining school buildings. I know that a lot of work is done on a voluntary basis and I want to acknowledge that effort which, I think, contributes so much to the sense of community involvement. Such community interest in schools is to be encouraged and is unquestionably beneficial for the children we are here to serve.

Micheál Martin

Micheál Martin, T.D.,
Minister for Education and Science.
June 1998

Contents

		Page No.
	Foreword	
Chapter 1	Introduction	1-01
Chapter 2	A Roof over our Heads	2-01
Chapter 3	Floors and Walls	3-01
Chapter 4	Doors and Windows	4-01
Chapter 5	External and Internal Finishes	5-01
Chapter 6	Heating, Plumbing and Drainage	6-01
Chapter 7	Electrical Installations	7-01
Chapter 8	External Works (Paved and Grassed Surfaces)	8-01
Chapter 9	Getting Work Done	9-01
Chapter 10	Furniture and Loose Equipment	10-01
	Appendix	App-01
	Glossary	Gl-01
	Index	Index-01
	Checklists	CHK-01

Introduction

Chapter 1

Chapter 1

Introduction

Grants Scheme for Minor Works to National Schools

A grant scheme for minor works to national schools has been introduced. In addition to its long-established responsibility for the maintenance of its school and grounds, a Board of Management now has the responsibility for the proper execution of minor works. The school must organise the execution of the works and pay the bills. Failure by a school to discharge this responsibility properly may jeopardise further funding. This manual gives clear, concise guidance on the range of typical maintenance matters that arise in national school buildings, and is designed to assist Boards of Management in the execution of their role in relation to the maintenance, upkeep and improvement of school premises.

Full details of the grants scheme for minor works to National School properties are set out in Department of Education Circular 3/96, dated May 1996, which is reproduced as an Appendix of this document.

Nature and Importance of Maintenance

Introduction

Building maintenance can be defined as a combination of technical and associated administrative actions to retain a building in, or restore a building to, a state where it can fulfil its required function satisfactorily.

Maintenance of school buildings is sometimes regarded as unproductive and is consequently neglected. Maintenance expenditure is sometimes kept to a minimum, and the long-term effects of this approach are ignored or misunderstood. Neglect of maintenance results in rapidly increasing deterioration of materials which can adversely affect the occupants and the contents of school buildings. All elements of a building deteriorate at different stages, depending on the material, construction method and environmental conditions.

Boards of Management are accordingly exhorted to adopt a "proactive" rather than a "reactive" approach to maintenance. The adoption of a "maintenance mentality" and a common-sense approach to maintenance and minor works should help ensure that the life expectancy of the school property is optimised.

Think maintenance!

BEST COPY AVAILABLE

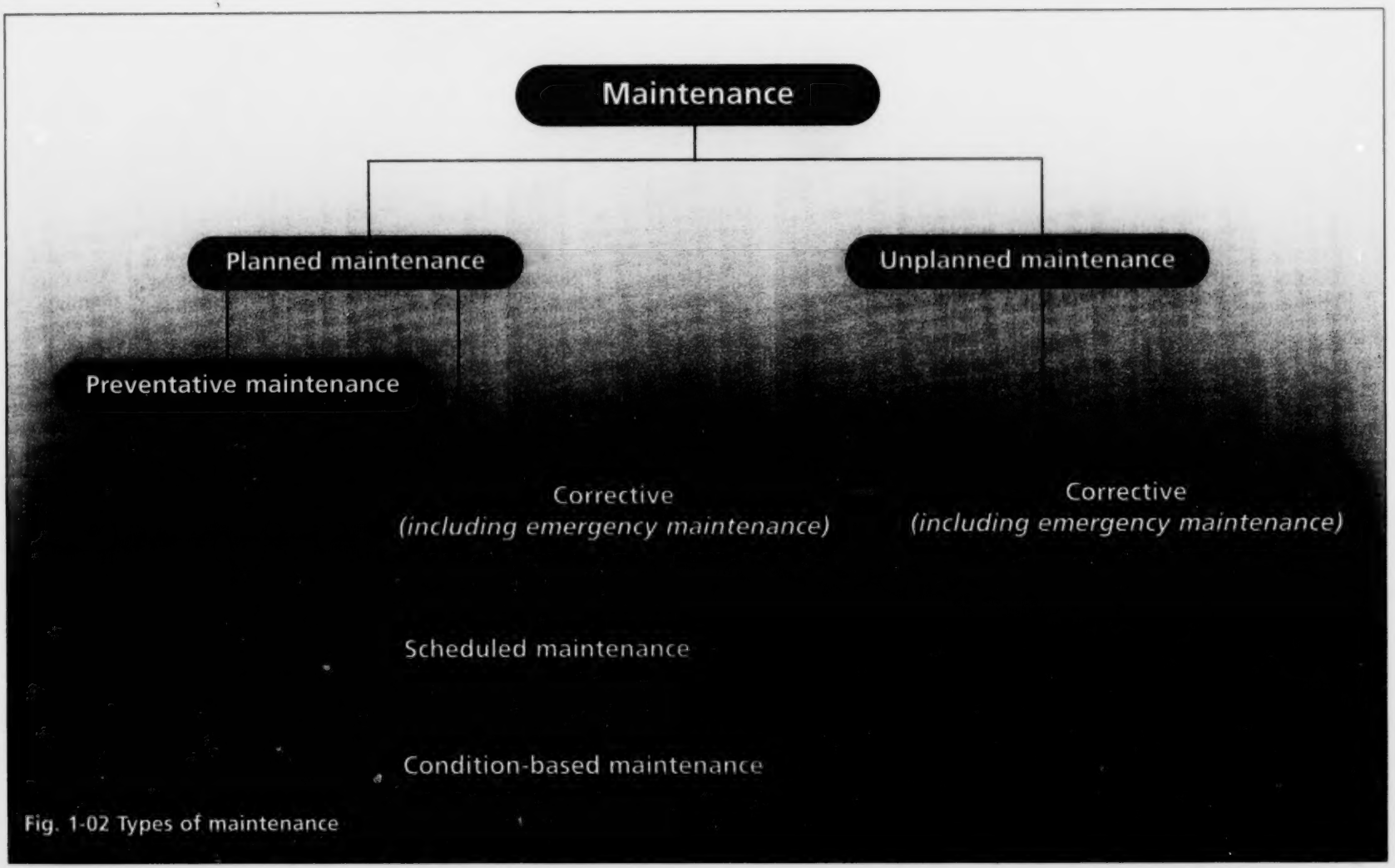


Figure 1-02 outlines in chart form various forms of maintenance.
The commentary on the following pages expands on the content of the chart.

BEST COPY AVAILABLE

As highlighted in Figure 1-02, maintenance falls into two broad categories, 'planned' and 'unplanned'.

Planned Maintenance

Planned maintenance, as the phrase suggests, comprises maintenance which is organised and carried out with forethought, control and in accordance with a plan. Boards of Management are exhorted to adopt such a strategy in relation to the maintenance of the property for which they are responsible. The checklists appended to this manual should be adopted as a model and modified, as appropriate, for individual schools.

Planned maintenance will be based primarily on a preventative approach, i.e. maintenance will be planned and carried out so as to avoid damage or deterioration of the structure and fabric of the building. For example, in a system of planned maintenance, decoration of external woodwork will be carried out at sufficiently frequent intervals to ensure that damage to the timber arising from rot or decay is, at best, prevented and, at worst, delayed for as long as possible. A well-managed system of preventative maintenance will also incorporate provisions for systematic inspections to allow for identification of items requiring attention or for planning of appropriate maintenance action in the future. A planned maintenance system, involving inspections at regular intervals, demands significant input and commitment by Boards of Management, but ultimately leads to lower maintenance costs, compared to an inspection system that is not planned.

Planned maintenance can be further classified into three sub-categories as follows:

- **Major repair or restoration**, such as reroofing or refurbishment works.
- **Periodic maintenance**, such as annual shampooing of carpets, regular decoration or servicing of heating and electrical systems.
- **Routine or day-to-day maintenance**, such as the cleaning of floors and windows.

Unplanned Maintenance

The alternative to planned maintenance is unplanned maintenance, which is primarily corrective in nature, i.e. maintenance work is carried out when defects become apparent. Such an approach is less satisfactory, and maintenance becomes primarily a "fire-fighting" activity, i.e. maintenance is only carried out when a major defect arises. Even in the best planned systems of preventative maintenance, the need for unscheduled emergency maintenance can arise, as for example when a drain blocks or when storm damage causes a roof to leak.

Maintenance Aims and Priorities

The main aim of maintenance is the preservation of a properly working building. The main priorities for maintaining school buildings are:

- **To protect the health and safety** of occupants of and visitors to the building.
- **To prevent or reduce deterioration** of the fabric of the building.
- **To maintain services** such as heating and lighting installations.
- **To maintain decorative** surfaces/finishes, and carry out adequate cleaning.

Deferred maintenance is a false economy. Remedial works will cost more in the long run.

Implications of Design and Construction for Maintenance

High maintenance costs can result from inadequacies at the design or construction stage, such as lack of or incorrectly placed damp proof courses, substandard materials or poor access and facilities for repairs. Often such shortcomings cannot be repaired satisfactorily within the scope of maintenance works.

Deferred maintenance is a false economy.

Prevention is better than cure.

Maintenance and Improvement Works - Some Examples:

Maintenance Items (to be funded from Capitation Grant)	Improvement works (to be funded from Minor Works Grant)
▼ Repair of storm damage to roof- replacement of dislodged tiles or slates.	▼ Installation of new windows to replace old decayed windows.
▼ Re-glazing of broken window panes.	▼ Installation of fire detection and alarm system.
▼ Repair of wet rot damage to individual window frames.	▼ Installation of new central heating boiler to replace obsolete unit.
▼ Painting of school building.	▼ Provision of new items of furniture.
▼ Routine servicing or repair of central heating boiler.	▼ Provision of physical education equipment.
▼ Periodic inspection/testing of fire detection and alarm system.	▼ Provision of new floor covering.
▼ Cleaning of carpets.	▼ Provision of new window blinds.
▼ Cleaning/repair of window blinds.	

Remember: Costs of maintenance (e.g. repair and upkeep) are to be funded from the school's Capitation Grant and improvement works (e.g. renewals and additions) are to be funded from Minor Works Grant. Note the distinction.
Costs of some of the maintenance items listed above may be recoverable under a school's building insurance cover.

Deferred maintenance is a false economy.

Prevention is better than cure.

Maintenance Matters

Chapter 2

A Roof over our Heads

2

A Roof over our Heads

The maintenance and repair of roofs is one of the most common and costly items associated with school buildings. This chapter summarises the most common problems which arise and highlights what Boards of Management can do to get the most out of the roofs of their buildings and, in the process, reduce maintenance costs.

The Basics

There are essentially two forms of roof: pitched roofs (usually covered with concrete tiles or slates) and flat roofs (usually covered with felt or a similar sheet material, or with asphalt).

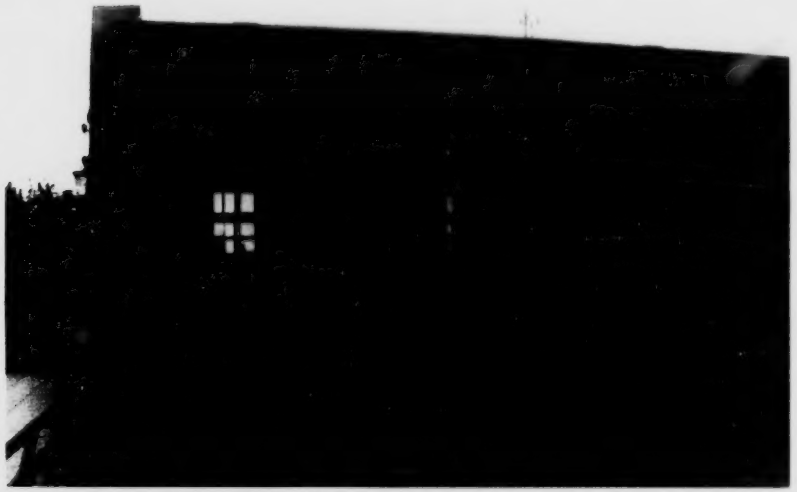
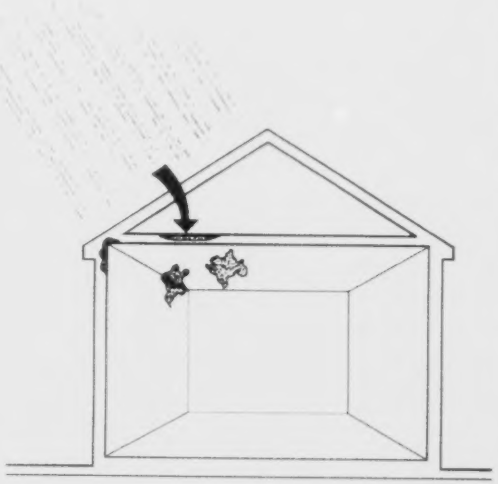
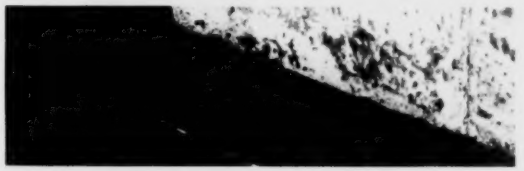


Figure 2-01 Pitched and flat roofs

Flat roofs, of their nature, are almost inevitably a more troublesome form of roof. They generally require more maintenance than pitched roofs and have a shorter life. Felt roofs typically require replacement after about 15 years, whereas a tiled or slated roof should have a "design life" of around 60 years. Defects in flat roofs require careful analysis to ensure that appropriate repairs or renewals are undertaken.

What goes wrong?	Why?	Matters for maintenance
Leaks, often first indicated by damp patches on ceiling or top of wall or by water dripping into the building.	Leaks are caused by: ▼ Slipped, broken or missing slates or tiles.	▼ Check roof annually and after storms for slipped, broken or missing slates and tiles. Repair/replace promptly. Consider acquiring a small stock of slates or tiles to facilitate such work.
	 Figure 2-03. Slate roof in poor condition.	
 Figure 2-02. Where dampness occurs.	▼ Defective metal "flashings" which are provided to form a waterproof seal at junctions such as chimney stacks and upstands on flat roofs. Typical defects: - not fixed correctly - cracked or corroded because of age - missing flashings arising from theft (lead flashings are a frequent target for thieves).  Figure 2-04. Defective flashing.	▼ Check condition of flashings as part of annual roof inspection. Seek advice about whether or not old flashings need to be repaired or replaced. Where theft of lead flashings is a problem, replace with low scrap value material such as zinc.

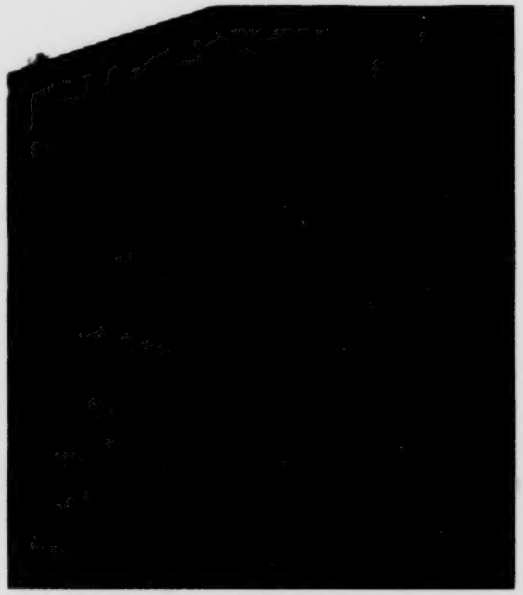
Checks roofs regularly for damage **When in doubt, seek expert advice**

What goes wrong ?	Why ?	Matters for maintenance
Leaks, *continued* Figure 2-05 Blocked rainwater outlet.	▼ Concrete (sand/cement) fillets (at junctions such as chimney stacks) which have shrunk or broken away.	▼ Defective fillets should be replaced with metal flashings.
	▼ Defective or blocked gutters and rainwater outlets on flat roofs.	▼ Gutters need regular cleaning and checking. Gutters should be cleaned twice annually and checked regularly for blockages such as leaves, balls and other debris which may cause blockages.
	▼ Excessive foot traffic on roofs (for example by maintenance operatives or unauthorised access). Inappropriate maintenance or work practices.	▼ Where possible, restrict foot traffic on roofs to a minimum. Readily climbed elements may allow access by vandals. Care should be taken by operatives on pitched roofs to avoid cracking slates or tiles. Use a roof ladder to minimise damage. Use of shovels to clear snow off flat roofs can lead to roof surface being punctured; the use of brushes is preferable.

Check and clean gutters frequently

Minimise foot traffic on roofs

BEST COPY AVAILABLE

What goes wrong?	Why?	Matters for maintenance
Leaks, *continued*  Figure 2-06 Cracking of flat roof surface	▼ Premature breakdown of roof covering, particularly on flat roofs. The most common causes are excessive solar heat gain in hot weather and chemical breakdown by the rays of the sun ("ultra-violet degradation").	▼ Flat roof coverings should have an appropriate form of solar protection, such as stone chippings ("spar" chippings) or reflective paint. Ensure that chippings are smooth/rounded and evenly spread over the entire roof surface sufficiently to obscure the roof covering. Excessive depths of chippings on a roof surface can cause damage by overloading the roof structure which can cause the roof to deflect excessively and compromise effective drainage. Purpose-made reflective coatings should be provided (where absent), checked annually and repaired or renewed as necessary. Use of inappropriate coatings can cause damage. If in doubt seek, expert advice.
	▼ Breakdown of roof coverings, particularly on flat roofs, at the end of their "design life".	▼ Repair or maintenance of roof coverings beyond their realistic life expectancy is likely to be of limited use and excessively costly. Substantial replacement may be a more cost effective option.

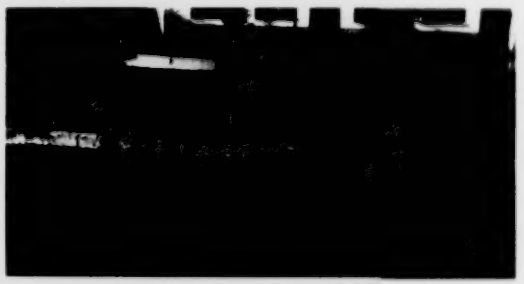
When in doubt, seek expert advice **Always adopt safe working procedures**

Pitched and Flat Roofs - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Leaks, *continued*	▼ Plumbing leaks within attic space of pitched roofs arising from - tanks overflowing - pipe bursts because of freezing or other causes - failure of joints in pipes within the roof space	▼ Ensure that tanks in roof spaces are fitted with an overflow pipe which discharges outside the building in a location where an overflow of water will be noticed. Check operation of ball-valves in water tanks annually. Replace defective valves. Check that tanks and pipes are "lagged" (insulated) and that insulation is securely fixed/located. In older school buildings pipes/tanks might not be insulated. Insulate such pipes/tanks. Where possible, arrange for regular checks of school, when unoccupied during "cold snaps", such as during Christmas holidays.
	▼ Condensation within the roof space.	▼ See page 2-10.

Check plumbing in roof spaces regularly **Insulate water tanks and pipes in roof spaces**

Pitched and Flat Roofs - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
"Blistering" of flat roof coverings, where the material rises in "bubbles" on the surface of the roof. Figure 2-07 Blistering on flat roof	▼ Blistering is caused by overheating of the roof surface in hot weather, combined with poor bonding of roof covering to material below.	▼ Minimise risk by ensuring roof covering is protected against excessive solar heat gain by chippings or reflective paint, as appropriate. Note that it is not necessary to repair "blisters" unless they are damaged or the roof covering is also cracked. In such cases, local repairs should be carried out to avoid subsequent leaks.
"Ponding" of water on flat roofs i.e. pools of water which do not drain off roof surface.  Figure 2-08 "Ponding" on flat roof	▼ Ponding can be caused by - inadequate drainage falls on roof, i.e. roof laid too flat - rainwater outlets wrongly located - rainwater outlets blocked.	▼ Clear any blocked rainwater outlets. Inadequate drainage falls or incorrectly located outlets are design/construction defects which cannot be remedied solely by maintenance works. Seek appropriate advice.

Protect flat roofs against the sun **Clear blocked drainage outlets**

BEST COPY AVAILABLE

Pitched and Flat Roofs - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Dry Rot - this is a very serious form of timber decay caused by fungal attack. If left unchecked, it can spread widely throughout a building and give rise to costly remedial work. When attacked by dry rot, timber becomes dry, brittle and cracked. In some cases fungal (mushroom-like) growths called "fruiting bodies" occur on the timbers. Another feature of dry rot is a strong musty smell in the vicinity of the out breaks.	▼ Dry rot will be "triggered" by a combination of damp timber, humid conditions and heat. Once established, however, it has the capacity to spread to dry timber; hence the term "dry" rot. Figure 2-09: Dry rot outbreak	▼ Rigorously check all accessible timbers annually for signs of dampness, mould or fungus. Especially vulnerable are roof and floor timbers which have been exposed to dampness (for example because of a leak). In older buildings, preventative measures involving the treatment of timbers with appropriate fungicide chemicals may be worth considering. Such treatment should be carried out only by competent personnel in strict accordance with the product manufacturers' instructions. Where an outbreak of dry rot is suspected or detected, seek expert advice. It is essential that treatment is effective and comprehensive, so as to avoid recurrent outbreaks and duplication of work and costs.

Check timber annually for rot/decay **When in doubt, seek expert advice**

Pitched and Flat Roofs - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Wet Rot - like dry rot (see above), wet rot is a form of timber decay. It occurs in timber which has been exposed to dampness over a period of time and typically occurs in: - Window and door frames - Timbers built into damp walls - Parts of roofs where leaks have occurred - Fascia and soffit boards, especially at corners.	▼ Prolonged exposure to moisture will cause wet rot in timber. Unlike dry rot, it will not spread to relatively dry timber, but can nonetheless give rise to quite expensive repairs, replacement and maintenance work. Figure 2-10. Wet rot decay in window frame.	▼ Check all external timbers annually for signs of decay. Deal with any outbreaks promptly. Regular painting (see chapter 5) of external timber is a significant preventative measure. Small areas of wet rot can in many cases be repaired without the need to replace the entire element (door, window). Timber used in such repairs should be treated with preservative prior to painting.
Woodworm	▼ Insect attack on timber, characterised by small "pinholes" on surface of timber. More common in older buildings. Can also occur in furniture.	▼ Check all accessible timber annually. Treat small outbreaks. In the case of extensive outbreaks, specialist treatment may be required. In extreme cases, it may be necessary to replace infected timbers.

Check timber annually for rot/decay **When in doubt, seek expert advice**

BEST COPY AVAILABLE

Pitched and Flat Roofs - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Birds, vermin and wasps nesting in roof space. In addition to the health hazard posed by vermin and the hazard of insect stings, water supplies in roof spaces can become contaminated.	▼ Access to roof available through gaps in construction.	▼ Cover water tanks within roof space. Check roof space and water tanks annually for any evidence of nesting. Close all obvious means of access but do not block off ventilation of roof space. If nesting occurs, it may be necessary to engage pest control specialists. Note that bats and some breeds of bird are protected species. Advice and assistance on dealing with protected species is available from the National Parks and Wildlife Service.
Sagging Roofs	▼ Sagging roofs can be caused by: - Overloading of the roof, for example, by additional water tanks or re-roofing a slated roof with concrete tiles. - Inadequate design of the roof structure. - Weakening of roof timbers owing to rot or decay. - Subsidence of the building structure as a whole.	▼ Remedies for structural settlement are beyond the scope of maintenance works. Substantial reconstruction may be necessary. Expert advice should be sought.

Check roof spaces regularly for nesting birds, vermin, wasps **When in doubt, seek expert advice**

Pitched and Flat Roofs - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Condensation in roof spaces (see also chapter 3 for treatment of condensation within the building proper).	▼ Vapour passing from warm, relatively humid rooms into the colder conditions in the roof space causes water to condense out of the vapour on to cold surfaces such as water pipes and roofing materials. In extreme cases, the water leaks back into the space below and may be misinterpreted as being caused by leaks in the roof covering. Condensation can also occur on the underside of poorly insulated roofs or the surfaces of "cold bridges" (i.e. the parts of a roof less well insulated than the surrounding area; for example the glass in rooflights). Condensation will occur during the winter months, particularly in cold, damp weather.	▼ Key points are: - Roof space ventilation. Ensure adequate ventilation of pitched and flat roofs. Do not allow eaves in pitched roofs to become blocked by insulation or other material. - Restrict vapour entering roof. - Encourage ventilation of classrooms during, between and after use. - Surfaces affected by mould growth and discoloration should be treated with appropriate fungicide wash at regular intervals, ideally annually, and before redecoration. See further guidance in chapter 3 in relation to condensation control. Note that, even with the best design and construction, some condensation is almost inevitable. The steps outlined above however, should, go a long way to reducing its extent and intensity.

To control condensation - ventilate roof spaces, ventilate rooms, minimise water vapour sources

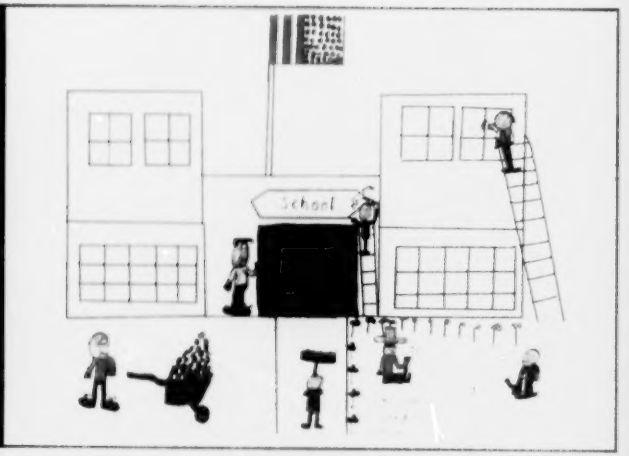
Pitched and Flat Roofs - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
▼ Asbestos products used in roof coverings	▼ In some older buildings, roof coverings incorporating asbestos fibre can be present. In some cases the nature and age of the material can pose a health hazard warranting its removal.	▼ Seek specialist advice from the Health and Safety Authority or Forbairt.
Problems with roofs of prefabricated accommodation. ▼ All the problems listed in the preceding pages for conventionally constructed roof can similarly arise in the roofs of prefabricated units.	▼ The range of problems that arise in the roofs of prefabricated accommodation are the same as those in conventional roofs-the causes of the problems are inevitably the same. See commentary on preceding pages.	▼ See advice on preceding pages in respect of: - Leaks - Blistering - Ponding - Dry rot - Wet rot - Woodworm - Birds, vermins, wasps nesting - Sagging roofs - Condensation

Pre-fabs are buildings too; look after them accordingly

BEST COPY AVAILABLE

3



Floors & Walls

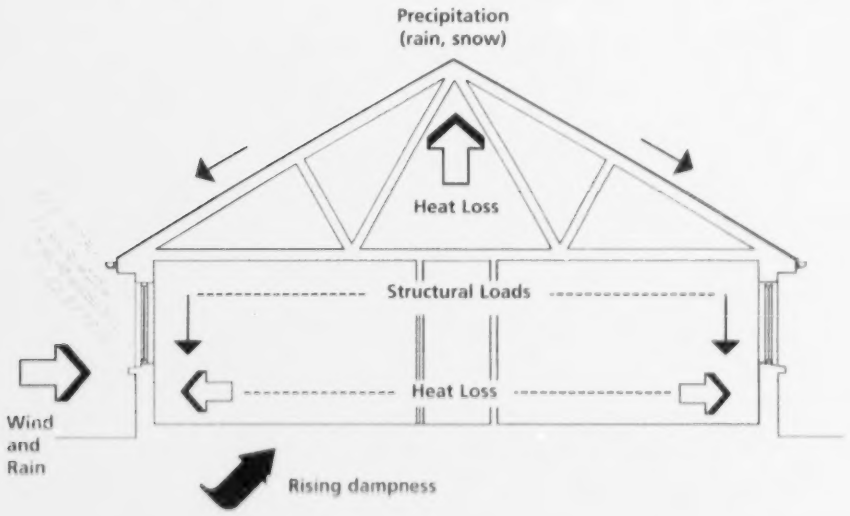
BEST COPY AVAILABLE

Chapter 3

Floors and Walls

The ground floor and external walls of school buildings, in conjunction with the roof, form the envelope which separates the accommodation from the external environment. Key functions of the ground floor and walls are the exclusion of dampness and moisture, and provision of reasonable levels of thermal comfort. This chapter deals with the most common maintenance issues which arise in relation to ground floors and external walls.

The Basics



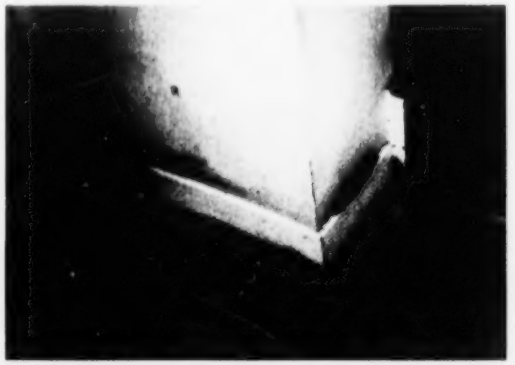
Functions of Ground Floors

- Structural - carry loads.
- Damp proofing - resist rising dampness.
- Thermal - reduce heat loss.
- Durability - resist decay, wear and tear.

Functions of External Walls

- Structural - carry loads.
- Weatherproofing - resist weather penetration.
- Thermal-reduce heat loss, heat gain, avoid condensation.
- Durability - retain appearance, resist wear and tear.

Figure 3-01. Cross-section through typical school building, highlighting key functions of external walls and ground floors.

What goes wrong?	Why?	Matters for maintenance
Penetrating dampness through walls, most commonly through walls exposed to the prevailing wind ("driving rain") or where evaporation is poor.	Damp penetration arises from: ▼ Solid wall construction, e.g. solid brick, stone.	▼ Solid wall construction is common in older school buildings. Isolated patches of dampness or leaking will usually be due to a specific cause and can be dealt with by appropriate treatment; see below for advice on treatment. More widespread dampness is likely to be beyond the scope of routine maintenance. In such cases, seek expert advice on ways to deal with dampness.
		
Figure 3-02. Cracking.	Figure 3-03. Penetrating (and rising) dampness.	
	▼ Cracks, which can be caused by: - Settlement - Weak mortar or plaster mixes - Inadequate design, construction or materials	▼ Cracks should be repaired/sealed to prevent dampness penetrating. Cracks may be caused by structural defects. If such a cause is suspected, expert advice is required to assess the extent of the problem and determine an appropriate remedy.

When in doubt, seek expert advice

Walls and Floors - The most common problems

What goes wrong?	Why?	Matters for maintenance
Penetrating dampness, *continued.*	▼ Dirty cavities. Mortar "droppings" which lodge in the wall cavity act as a "bridge" for moisture to pass through the wall from outside to inside.	▼ The ingress of moisture across a cavity bridged by mortar droppings requires to be remedied by the opening of the wall and removal of the mortar. This is a specialist item requiring appropriate expertise; if in doubt, seek expert advice.
	▼ Absence of DPCs (damp proof courses) around openings such as doors and windows. Generally in buildings with solid wall construction, or those built prior to the 1920s DPCs would not have been inserted. In newer school buildings DPCs might be omitted in error or incorrectly installed at the construction stage.	▼ Seek expert advice on the best way to overcome dampness penetration arising from the absence of DPCs.
	▼ Leaks in gutters, downpipes.	▼ Inspect gutters and downpipes regularly. Make sure all fixings are securely in place. Remove/replace any cracked gutters or downpipes where the cracks cannot be repaired.

Check regularly for obvious sources of dampness **When in doubt, seek expert advice**

Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Penetrating dampness, *continued.*	▼ Failure of mastic seals surrounding windows and doors. Mastic failure can be caused by: - Poor workmanship in application - Premature mastic failure - Age - Vandalism	▼ Check surrounds to windows and doors for dampness not caused by condensation. Remove existing mastic and replace with a suitable new compound. Follow instructions for use of mastic, especially in relation to surface preparation. Timber that has been damaged by dampness will need to be treated immediately. See chapter 2 for treatment of wet rot.
	▼ Moisture ingress at the junction between extensions and existing buildings is caused by: - Missing cavity trays - Faulty DPCs - Defective flashings - "Differential settlement" of the foundations	▼ See guidance above relating to: - Absence of DPCs. - Cracks
Rising dampness through floors and walls owing to lack of or defective damp proof courses and/or damp proof membranes (DPMs).	▼ Absence of DPCs (damp proof courses) in walls at or close to ground level. Generally in buildings built prior to the 1920s DPCs would not have been inserted. In newer school buildings, DPCs might be omitted in error or incorrectly installed.	▼ Seek expert advice on the best way to overcome dampness penetration arising from the absence of DPCs.

Check regularly for obvious sources of dampness When in doubt, seek expert advice

BEST COPY AVAILABLE

Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Rising dampness, *continued.*	▼ Absence of DPM (damp proof membrane) in solid ground floors. In older school buildings, DPMs would not have been standard practice. In newer school buildings DPMs might be omitted in error or incorrectly installed.	▼ Seek expert advice on the best way to overcome dampness penetration arising from the absence of DPMs.
	▼ Defective DPMs arising from: - Punctures due to poor workmanship - Junction where DPC and DPM meet incorrectly lapped - Failure of material	▼ Check timber/concrete floors for signs of dampness, and staining on walls where dampness may have risen. Seek advice on whether or not the DPM can be readily fixed at junctions or whether or not the whole DPM needs to be replaced.
	▼ Rising dampness that bypasses the DPC can be caused by: - Mortar droppings within the cavity - External render bridging DPC - Erection of extensions or porches without proper cavity trays	▼ Check external and internal wall faces for signs of dampness, particularly at junctions around extensions.

Check regularly for obvious sources of dampness — When in doubt, seek **expert advice**

BEST COPY AVAILABLE

Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Rising dampness, *continued.*	▼ Moisture that bypasses the DPC in wall at ground level: - DPC and DPM junction is faulty - DPC incorrectly installed - Ground level externally higher than level of DPC	▼ Check for discolouration and dampness at wall and floor junctions. Excavate soil that is higher than DPC level; reduce to at least 150 mm below DPC. Seek advice concerning detail or construction faults.
Efflorescence in brickwork. Staining caused by soluble salts which appear as loose white powder on the brick face. Can occur internally as well as externally. It is usually harmless and is generally washed away by rain externally.	▼ The salts usually come from the brickwork or soil in contact with the brickwork. Figure. 3-04. Efflorescence in brickwork.	▼ The staining (white powder) is usually washed away by rain. Brickwork can be brushed to remove the powder. In sheltered situations, it may be necessary to hose down the brickwork to remove the staining.
Staining of brickwork.	▼ Staining usually occurs when rainwater runs freely down a wall face, with no projection to prevent this happening. Green stains are caused by the corrosion of copper or bronze.	▼ Check external face for staining. Wash the affected area with clean water. Green stains may be harder to remove. Many stone-and brick-cleaning solutions are strongly acidic and may permanently damage the materials. Follow instructions for use rigorously.

Check brickwork for efflorescence and staining **When in doubt, seek expert advice**

What goes wrong?	Why?	Matters for maintenance
Dry Rot and Wet Rot in floors are forms of timber decay due to dampness. Dry rot is very serious, and can spread rapidly throughout the floor. Wet rot will occur when timber is exposed to dampness over a period of time, but will not spread. Refer to chapter 2.	▼ Dry rot will be 'triggered' by a combination of damp timber, humid conditions and heat. Once established, however, it has the capacity to spread to dry timber - hence the term "dry" rot. Prolonged exposure to moisture will cause wet rot in timber. Unlike dry rot, it will not spread to relatively dry timber, but can nonetheless give rise to quite expensive repairs, replacement and maintenance work.	▼ Rigorously check all accessible timbers annually for signs of dampness, mould or fungus. Especially vulnerable are roof and floor timbers which have been exposed to dampness (for example because of a leak). In older buildings preventative measures involving the treatment of timbers with appropriate fungicide chemical may be worth considering; such treatment should be carried out only by competent personnel in strict accordance with product manufacturers' instructions. Where an outbreak of dry rot is suspected or detected, seek expert advice. It is essential that treatment is effective and comprehensive, so as to avoid recurrent outbreaks and duplication of work and costs. Small areas of wet rot can in many cases be repaired without the need to replace the entire element (e.g. floor joist, timber flooring). Timber used in such repairs should be treated with preservative.

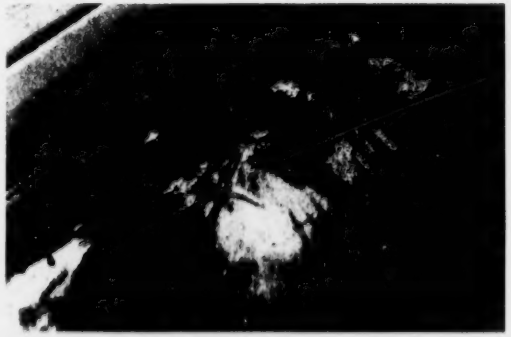


Figure 3-05. Rot in floor.

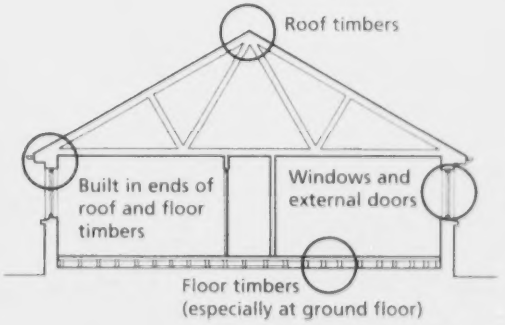

Roof timbers
Built in ends of roof and floor timbers
Windows and external doors
Floor timbers (especially at ground floor)

Figure 3-06. Typical locations for timber decay.

Check timber annually for rot/decay

When in doubt, seek expert advice

Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Frost action, which can cause "spalling" (crumbling of the surface) of brickwork and disintegration of mortar. Cracks in external render (plaster) are vulnerable to water penetration, which can lead to "spalling" of the render as a result of frost action.	▼ Stronger mortars are more prone to frost attack, are vulnerable to shrinkage and cracking, which allows water to penetrate into the cracks. Water can penetrate cracks in plaster work, freeze, expand and break off a portion of the brick/mortar/external plasterwork.	▼ Check mortar and plasterwork for any cracks. Fill them. If the wall face has already been attacked by frost, it may be necessary to seek advice for the repair of the damaged area.
Cracks	▼ Cracks can be caused by: - Settlement of structural elements - Shrinkage due to moisture - Evaporation - Expansion because of water penetration - Breakdown of concrete elements	▼ Check walls and floors internally and externally for cracks. Seek advice about cracking.
Lichens, Moulds and Other Growths - rarely destructive but climbing or other plants can cause damage to walls. Ivy with its aerial roots can penetrate cracks or soft mortar and cause damage.	▼ Lichen growth can cause staining to wall surfaces.	▼ Remove growths and treat with a recommended toxic wash during a dry spell. This will prevent or destroy growths. Control climbing plants; keep away from window and door frames, and below the eaves level.

Check annually for cracks

Treat lichen and mould growth

Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Condensation on wall and ceiling surfaces	▼ Warm vapour in relatively humid rooms causes water to condense out of the vapour on to cold wall surfaces. This can be misinterpreted as being caused by leaks. Condensation can also occur on the underside of poorly insulated roofs or the surfaces of "cold bridges" (i.e. the parts of a roof less well insulated than the surrounding area; for example the glass in rooflights).	▼ Key points for condensation control are: - encourage ventilation of classrooms during, between and after periods of use - surfaces affected by mould growth and discolouration caused by condensation should be treated with appropriate fungicide wash at regular intervals, ideally annually, and prior to redecoration.
 Figure 3-07. Mould growth due to condensation.	▼ Condensation will occur during the winter months particularly, in cold, damp weather.	▼ See further guidance in chapter 2 in relation to condensation control in roof spaces. It should be noted that, even with the best design and construction, some condensation is almost inevitable. The steps outlined above , however should go a long way towards reducing its extent and intensity.

Ventilate rooms thoroughly and often

Treat mould growth promptly

Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Leaking heating pipes in floors.	▼ Leaks in heating pipes caused by: - old age and corrosion - bursts due to freezing - poor pipe connections - punctures due to poor workmanship.	▼ Seek expert advice. See also guidance in chapter 6 in relation to maintenance of heating systems and pipework.
Condensation on floor surface	▼ High humidity levels, combined with cold, usually uninsulated, floor surfaces.	▼ Ventilate the space as much as possible. Improve levels of heating if possible. Consider change of floor surface. In extreme cases seek expert advice.
Lifting of floor finishes, such as PVC sheeting and tiles.	▼ Lifting of floor finishes is mainly caused by the "drying-out" of moisture in floor slabs in new buildings.	▼ Seek expert advice.

Check regularly for leaks **Repair leaks promptly**

BEST COPY AVAILABLE

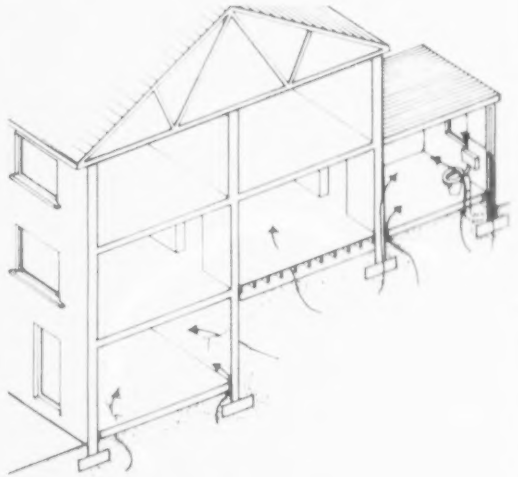
Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Problems with floors and walls of pre-fabricated accommodation. ▼ All the problems listed in the preceding pages for conventionally constructed floors and walls can similarly arise in the floors and walls of prefabricated units.	▼ The range of problems that arise in the floors and walls of prefabricated accommodation are the same as those in conventional floors and walls. The causes of the problems are inevitably the same. See commentary on preceding pages.	▼ See advice on preceding pages in respect of: - Penetrating dampness - Rising dampness - Dry rot and wet rot in floors - Cracks - Lichens, moulds and other growths - Condensation on wall and ceiling surfaces - Leaking heating pipes - Condensation of floor surfaces - Lifting of floor finishes

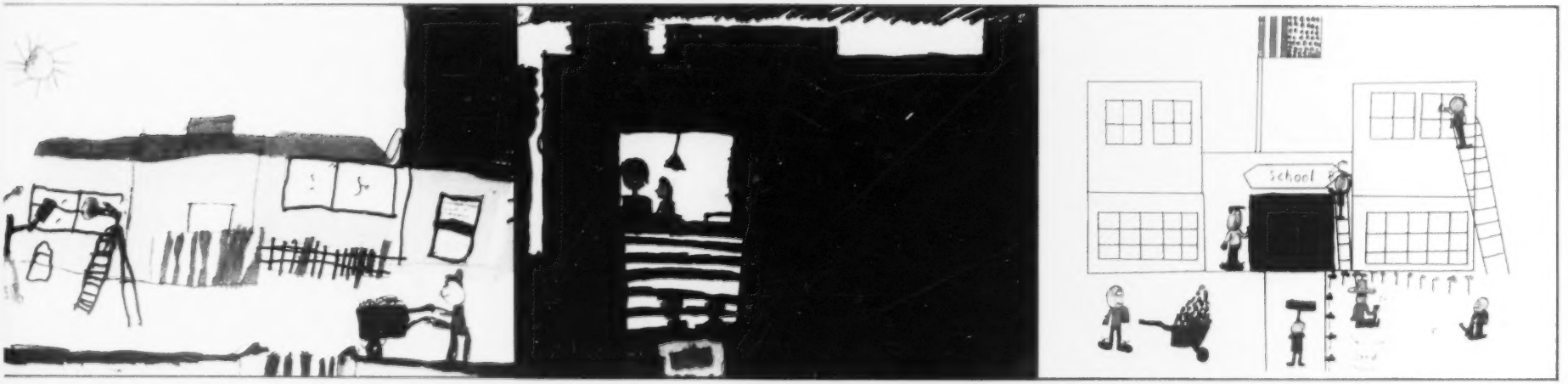
Figure 3-08. Poorly maintained prefabricated accommodation.

Pre-fabs are buildings too; look after them accordingly

Walls and Floors - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
▼ **Excessive accumulations of radon gas within buildings.** Radon is an odourless, colourless, radioactive gas which occurs naturally in the subsoil. In certain circumstances it can accumulate in what are considered to be hazardous concentrations inside buildings.  Figure 3-09 Major radon entry routes.	▼ Radon gas infiltrates buildings from the underlying ground through cracks in floors, penetrations for building services and cavities and voids within the construction. ▼ Modern buildings tend to be more "gas-tight" than older buildings Since they are better sealed against the weather and draughts. High concentrations of radon tend to be associated with such buildings. For general information on radon or to obtain a measurement contact *The Radiological Protection Institute of Ireland (RPII) 3 Clonskeagh square, Clonskeagh Road, Dublin 14 (Tel 01 269 7766)* For information on radon reduction techniques contact *The Planning and Building Unit, department of education and Science, Tullamore, Co. Offaly.*	▼ Boards of Management have their buildings monitored to establish radon levels. Ideally, this should be done on a regular basis; for example, once during the three-year term of any Board of Management. ▼ Where remedial works arise, the solution will depend on the building construction and configuration. The principal options are: - Sealing of potential radon gas routes (usually not readily achieved in an existing structure). - Provision of sub-floor ventilation. - 'Pressurisation' using supply air fans. - 'De-pressurisation' (extract fans). - Filtration of air, to remove radon. Where radon remediation work has been carried out to reduce indoor radon levels it is important to service and maintain the mitigation equipment every 12 months. In order to ensure the continued effectiveness of the system, the school should be remeasured every five years.

When in doubt, seek expert advice



Doors & Windows

Chapter 4

Chapter 4

Doors and Windows

Doors and windows are elements subjected to substantial wear and tear in school buildings. Constant opening and closing, together with exposure to the elements, inevitably take their toll and can give rise to leaks, draughts and associated damage to the building fabric, as well as unnecessary heat loss and additional energy costs. This chapter gives key guidelines to Boards of Management for the maintenance of doors and windows.

The Basics

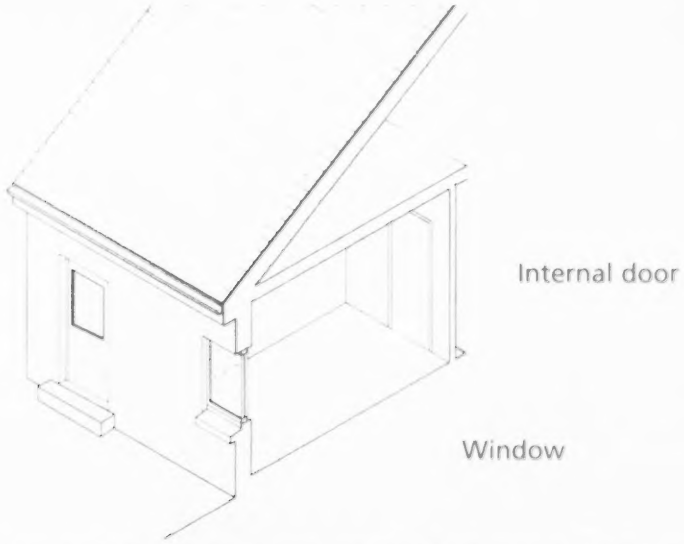
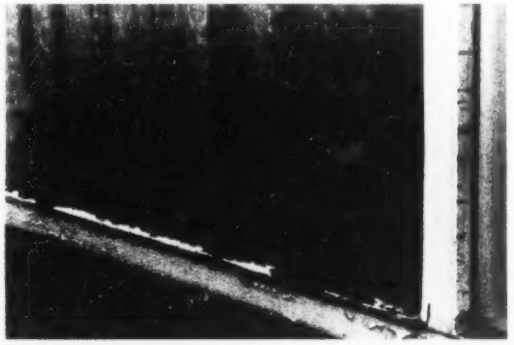


Figure 4-01: Section through typical school building, highlighting doors and windows (including internal doors).

Doors and Windows - The most common problems

What goes wrong?	Why?	Matters for maintenance
Leaks at and around doors and windows	▼ **Damp penetration arises from:** - Gaps in and around doors/ windows - Poorly fitting doors/windows. - Inadequate damp proof courses - Failure of mastic sealants - Damaged or missing weather boards at door thresholds - Broken glass	▼ Replace or repair as appropriate. Some causes of leaks, such as the absence of damp proof courses, may be beyond the scope of routine maintenance.
Fungal decay, most typically wet rot. Dry rot can also attack timber doors and windows.  Figure 4-02. Wet rot in window frame.	▼ See commentary in chapters 2 and 3 on wet and dry rot.	▼ See commentary in chapters 2 and 3 on wet and dry rot. **Note the importance of regular decoration in protecting timber elements against decay.**

Check regularly for rot/decay Decorate timber at **frequent intervals**

Doors and Windows - The most common problems

What goes wrong?	Why?	Matters for maintenance
Doors and windows sticking, jamming	▼ Timber in doors and windows when they absorb moisture can swell.	▼ Plane door or window to ease fit. Decorate all exposed timber surfaces by planing.
	▼ Wear and tear can loosen hinges, causing jamming.	▼ Repair as necessary.
	▼ Broken cords in up-and-down sash windows.	▼ Renew sash cords.
	▼ Distortion/twisting of opening section of window. This can occur in windows of any material.	▼ In the case of PVC or aluminium frames, specialist repair to the section is usually required. Deformation/ twisting of timber frames usually requires that the casement in question be replaced.
Broken glass	▼ Accidental damage, storm damage, vandalism.	▼ Repair all breakages promptly. In the case of glazing at low level or large single panes in doors and panels extending close to floor level, appropriate grades of safety glass should be used. Seek expert advice.

ows/doors regularly for proper fit

Repair breakages promptly

BEST COPY AVAILABLE

Doors and Windows - The most common problems

What goes wrong?	Why?	Matters for maintenance
Putty missing	▼ Birds eat putty, especially where it has not been painted.	▼ Replace putty with timber glazing beads bedded in an appropriate grade of mastic or glazing compound. Decorate to match window finish. It is an opportunity to check timber frames for rot and decay and may also be an appropriate time at which to redecorate frames.
Dirty windows	▼ Normal wear and tear.	▼ Clean windows regularly. Adopt appropriate safety procedures where access to glazing at high level is required.
Draughts. Draughts should be distinguished from necessary and acceptable air movement for the purposes of ventilation. Such ventilation is essential to ensure reasonable levels of environmental comfort (to control stuffiness and overheating) and to control the risk of condensation. Draughts, on the other hand, impinge excessively on the comfort of occupants and can give rise to excessive heat losses in buildings.	▼ Draughts arise from: - Gaps around doors and windows - Poorly fitted doors and windows - Air movement in voids under suspended timber ground floors	▼ Draught stripping of doors and windows is a simple and cost-effective means of draught proofing. Blocking of air vents provided for ventilation purposes should not be undertaken to reduce draughts, nor should the fixing shut, by nailing or screwing, of opening sections of windows. Similarly, under floor vents provided to ensure adequate ventilation of underfloor spaces should not under any circumstances be blocked up.

Check windows regularly for damage, dirt, draughts Repair and clean draught-proof windows as required

Doors and Windows - The most common problems

What goes wrong?	Why?	Matters for maintenance
Doors/windows require replacement	▼ **Age, wear and tear, any combination of the factors outlined above.**	▼ Where substantial or total replacement of doors/windows is proposed, Boards of Management should take expert advice in the matter. The following are among the issues relevant in the consideration of a door/window replacement job: - Technical quality of the replacement elements (durability, suitability). - Expertise and competence of installers. - Visual appearance and consistency with elements being replaced or similar elements being retained (the local planning authority may have specific guidelines on the topic of replacement windows). - Design of opening sections of windows to ensure ready and adequate ventilation.
Fire Door defects: - Intumescent strips - Closers - Smoke seals - Hinges	▼ **Wear and tear, physical damage, vandalism.**	▼ In fire doors, replace like with like. If in doubt, seek expert advice. Fire doors are relatively sophisticated assemblies and should be specified, supplied, installed and repaired by competent persons.

Seek expert advice when replacing doors or windows

Doors and Windows - The most common problems

What goes wrong?	Why?	Matters for maintenance
Ironmongery defects: - Handles, hinges, closers - On doors and windows - Restrictors on high level windows	▼ Wear and tear, physical damage, vandalism.	▼ Replace with commercial quality heavy duty components. The use of cheap material is a false economy. In fire doors, replace defective ironmongery with identical components. Check ironmongery regularly. Watch solidity of fixings (e.g. handles to frames). Watch safety considerations (e.g. ironmongery on escape routes). Defective restrictor on high-level window may allow window to open excessively and pose a risk of failing.
Condensation weepholes become blocked	▼ Accumulation of dirt/debris, over-painting.	▼ Weepholes should be provided in all single-glazed and timber windows and should be kept clear at all times. Failure to do so can lead to accumulation of water run-off from condensation on the surface of the glazing. This in turn can lead to rot and decay of timber components and unsightly mould growth on affected surfaces.

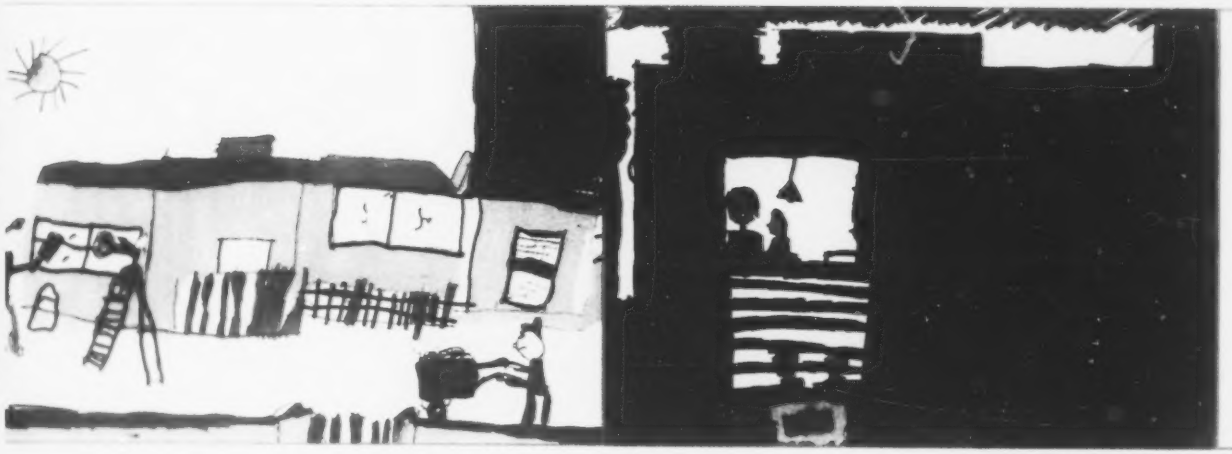
All comments in this chapter are as applicable to doors and windows in prefabricated accommodation as to conventional buildings.

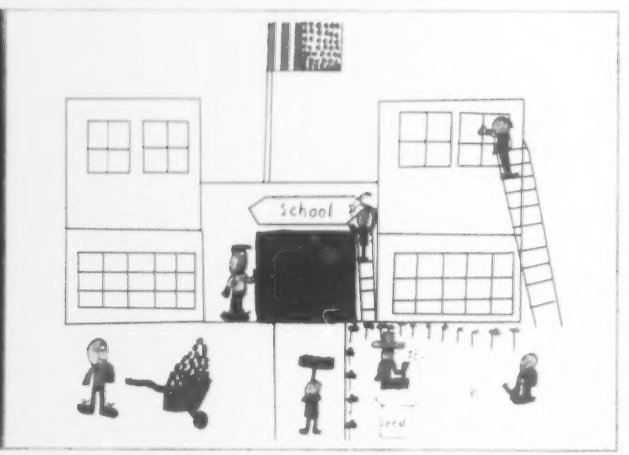
Pre-fabs are buildings too look after them accordingly.

BEST COPY AVAILABLE

Maintenance Matters

Chapter 5





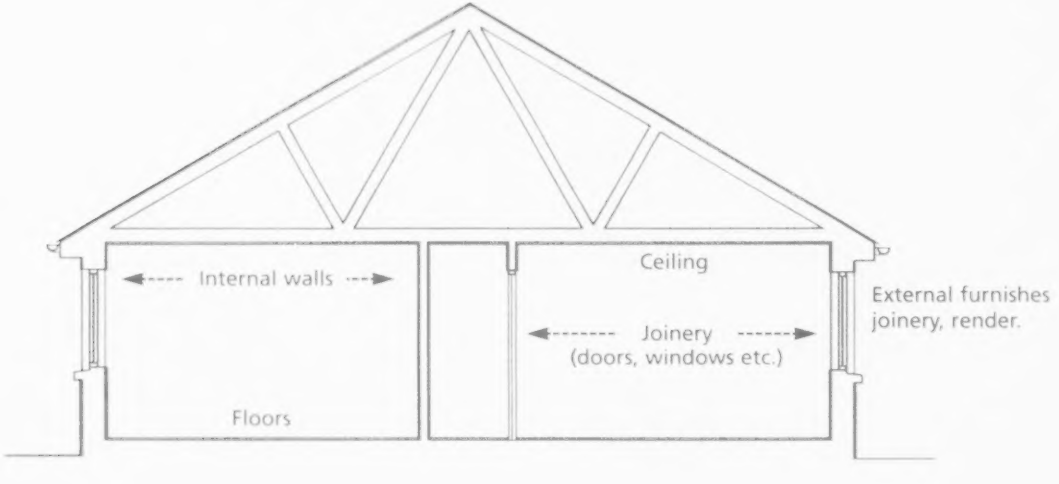
External & Internal Finishes

5

External and Internal Finishes

Apart from providing acceptable appearances to walls, floors, ceilings and joinery, appropriate finishes contribute significantly to the durability of the school fabric. Proper choice and care of finishes can contribute not only to the appearance of a school and its environment but also to limiting the extent of wear and tear, prolonging its useful life and reducing running costs. The commentary in this chapter examines the principal maintenance issues which arise for Boards of Management in relation to finishes.

The Basics



Cracking/blistering/peeling. 	Poor preparation of surface, poor application of paint, dampness.	Make good at time of scheduled repainting. See chapter 3 for advice relating to penetrating and rising dampness. Use appropriate paint specification for external surfaces, such as masonry paint on rendered surfaces. Ensure that paints/varnishes are applied to a compatible surface: surface should be thoroughly prepared (cleaned, filled and sanded as necessary). In the case of a change of decorative material (e.g. from gloss to emulsion paint) a suitable primer might be necessary to ensure satisfactory bonding of this new coat. Where possible, avoid overpainting on varnished surfaces. If painting is necessary, the varnish should be stripped and the base timber primed prior to painting.

Prepare surfaces correctly before decorating **Read what's written on the tin**

What goes wrong?	Why?	Matters for maintenance
continued		
Ageing, wear and tear, rusting of metal elements, such as steel windows and gates.	Normal use, abuse, wear and tear.	Make provision for regular redecoration of all painted surfaces, inside and out. It is recommended that repainting should generally be carried out at five-year intervals. In some circumstances, the interval might be lengthened to seven years.
Pattern staining on painted surfaces.	Variations in construction behind surface.	Clean surfaces thoroughly as part of preparation for regular re-painting. Pattern staining arises from the nature of inherent construction and its elimination is usually beyond the scope of routine maintenance.
Putty to glazing cracking, falling out.	Natural ageing, inadequate painting, birds eating putty (see chapter 4).	Renew defective putty as part of regular, planned redecoration.
Fading, blistering of decorative stains, and varnishes on timber.	Natural ageing, exposure to sunlight.	Renew finish in accordance with manufacturer's recommendations.

Redecorate at frequent intervals **Read what's written on the tin**

Linoleum and Vinyl. Important do's and don'ts

Do's	Don'ts
Use dust control mopping frequently. A dust control mop is a mop with a specialised cloth (slightly damp). Use the mop frequently in heavy duty areas.	Don't mix cleaning chemicals unless specified by the manufacturer. This can be harmful to the floor coverings, animals and humans.
Use minimum moisture on the floors.	Don't change chemical manufacturer's dilution rates. More is not necessarily better, but can be expensive and even harmful.
Keep all cleaning machinery and equipment in good working order.	Don't use excess moisture this merely creates more work clearing up.
Mop up spillages as soon as possible; prevent spots becoming stains.	Don't apply polishes to wet or dirty floors.
Purchase good quality products, this will help provide cost effectiveness.	Don't use polishes on static-dissipative or 'safety' floors without consulting manufacturer.
Erect caution signs every time you carry out cleaning tasks.	Don't allow wax polish to be mixed with other polishes.
Remember to rinse and neutralise floors prior to any application of polish.	Don't use no-rinse strippers on linoleum.
Use a colour-coded mopping system.	Don't wet, clean or polish the floor for at least 48 hours after installation, to allow adhesive to cure. Ideally the floor should be left for at least 5 days. If this is impossible, minimum moisture techniques are essential.

Follow correct cleaning procedures **Follow correct safety procedures**

Finishes - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Linoleum and Vinyl Flooring		
▼ Excessive scratching of floor surface.	▼ Ineffective barrier mat or none at all.	▼ Arrange for installation of barrier mat.
▼ After application of polish floor, finish begins to whiten up or powder.	▼ Excessive alkalinity used in cleaning or stripping process. No rinse stripper used or used incorrectly.	▼ Reclean floor ensuring that floor rinse is neutralised.
▼ Colour change.	▼ Excessive alkalinity used in cleaning or stripping process.	▼ Clean immediately to remove alkalinity; colour may be restored.
▼ Colour fade.	▼ Mopping system contaminated with bleach or similar volatile cleaning solution.	▼ Rinse thoroughly with clean water. Only use recommended cleaning solutions by manufacturers.
▼ Tiles or sheets lifting at edges.	▼ Excessive moisture used (probably combined with excessive alkalinity), seeping into joints. Wet floor cleaned before adhesive has fully dried.	▼ Consult flooring contractor for repair.
▼ Polish is not drying between coats.	▼ Location of flooring too cold or poor ventilation.	▼ Introduce a heat source such as turbo blower.
▼ Polish wearing off quickly.	▼ Excessive grit on the flooring.	▼ Use a barrier mat at the entrance.
▼ Floor shiny on non-traffic areas but dull or whitish bloom in traffic lane.	▼ Floors maintained with highly alkaline chemicals.	▼ Remove coating on floor covering and reapply a neutral coating.

Always follow recommended maintenance procedures **Read what's written on the tin**

Finishes – The most common problems (continued)

	Why?	Matters for maintenance
continued.		
Black rubber heel marks on flooring.	Some black marks are normal and some are excessive.	Spray marks prior to cleaning and leave. After about a minute, return and scrub in, working in until blended with surrounding area. Ensure that the cleaning machine is that recommended for the particular floor type.
	Severe black marks.	Use a hand tool containing the correct pads, which will give extra purchase. Wipe off with a clean cloth and buff the area to blend in. Severe black marks left on vinyl floors for a long time will react chemically with the floor and cannot be entirely removed.
Floor appears shiny but is dark and dirty.	When floor polish was being applied dirt got mixed into it. The area polished was not clean before polishing.	Strip the polish from the flooring. Clean the floor thoroughly and reapply the polish.
White or coloured spots.	Chemicals spilt onto the floor surface.	Rub down with an abrasive nylon pad. Rinse and reapply polish.
Areas of a new linoleum floor have a yellowish colour.	Stove yellowing.	Normal. This yellowing is an 'oxidation film' which disappears on exposure to light, even after polish has been applied.

Always follow recommended maintenance procedures **Read what's written on the tin**

Finishes - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Linoleum and vinyl flooring *continued.* ▼ Linoleum and vinyl floor coverings not properly maintained.	▼ Absence of proper maintenance planning. Lack of knowledge of good floor maintenance practice.	▼ Daily to weekly. - Clean floor with a dust control mop. - Remove spots by damp mopping or by hand scrubbing with water and neutral maintainer (only if required). ▼ Weekly to monthly. - Light scrubbing with neutral maintainer and edging tool. Use a sponge mop to pick up residue. Damp mop with clean water. ▼ Periodically, at least once a year. - Scrub the floor with edging tool or deck scrubber. Use a sponge mop to pick up residue. Dampen mop with clean water. - When floor is dry, apply recommended protection covering to floor.

Always follow recommended maintenance procedures **Read what's written on the tin**

Finishes - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Carpets		
▼ Stains in fibre-bonded carpets.	▼ Normal usage, wear and tear, accidental spillages, vandalism.	▼ Fibre-bonded carpets have a low moisture absorbency level and have the ability to release most general stains. ▼ It is essential to deal with all spillages immediately and any subsequent stains as appropriate. Blot spillages with a clean absorbent cloth. If any stain remains or if the stain-dried, it will be necessary to use one of the methods described below.
▼ Stains in other types of carpet.	▼ Staining can arise many different causes, such as: - Coffee, tea, blood, mineral and fruit juices, food, fountain pen ink, vomit and water-based paint. - Shoe polish, butter and other greases, ointment, ice-cream, milk and oil-based paint. - All inks except fountain pen ink. - Dried blood. - Chewing gum, modelling clay.	▼ There are many methods of removing stains, such as: - Liquid detergent solution. Apply sparingly. Using a small hand brush, work solution into carpet, allow to dry and vacuum. - Dry solvent spotters. - Methylated spirits. - Paste of biological detergent mixed with a little water. Moisten stain with warm water and apply paste. Keep moist for about 2 hours. Sponge with clean warm water, blot with absorbent cloth.

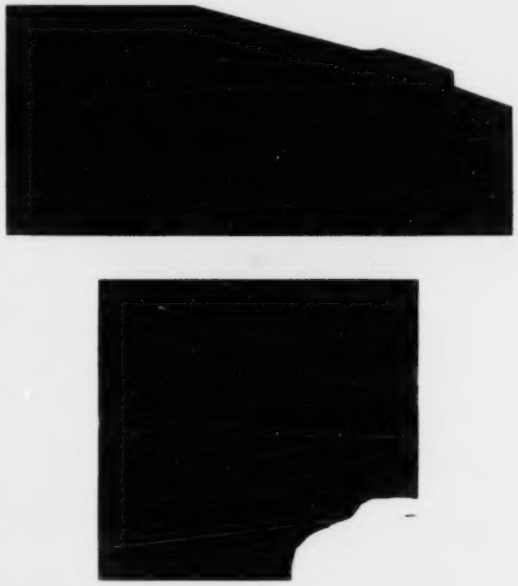
Always follow recommended maintenance procedures **Read what's written on the tin**

BEST COPY AVAILABLE

What goes wrong?	Why?	Matters for maintenance
▼ Carpets *continued*		Scrape up the excess with a blunt-edged knife. Apply freezer spray and scrape or brush out.
▼ Neglect of fibre-bonded carpets.	▼ Inadequate maintenance. Lack of knowledge of correct maintenance procedures.	▼ Daily vacuuming with a rotary brush vacuum cleaner is preferable. It is essential to remove loose soil daily because, if left to build up, it is much harder to remove the dirt and can damage the fibres. Depending on the level of foot traffic, the carpets should be periodically deep-cleaned. The carpets should be cleaned at least every year, using high performance hot water extraction equipment. Cleaning frequency may need to be increased for carpets in areas of heavy foot traffic, such as corridors.

Always follow recommended maintenance procedures **Read what's written on the tin**

Finishes - The most common problems (continued)

What goes wrong?	Why?	Matters for maintenance
Graffiti 	▼ All readily accessible surfaces are likely targets for the "graffiti artist".	▼ Appropriate treatment will vary with the material used and the surface affected: - Options include chemical removal and mild abrasive. - Treatment of the cleaned surface with an anti-graffiti surface coating will allow subsequent graffiti attacks to be removed with hot water pressure jets. - In the case of persistent graffiti problems, Boards of Management might consider placing graffiti maintenance contracts with a firm specialising in such works. See classified telephone directories for listings of such contractors.
▼ Asbestos products used as wall and ceiling linings	▼ See page 2-11	▼ See page 2-11

All comments in this chapter are as applicable to prefabricated accommodation as to conventional buildings.

Pre-fabs are buildings too; look after them accordingly

6

Heating, Plumbing & Drainage

Chapter 6

Heating, Plumbing and Drainage

The heating and plumbing system within primary schools typically comprises water storage tanks and cisterns, supply and distribution pipes for hot and cold water, fittings, such as sanitary fittings and sinks, heating boilers, heating pipework and radiators. Drainage systems are usually made up of above and below ground pipework which connects to local authority sewers or, in some cases, to on-site septic tanks or sewage treatment plants. This chapter deals with maintenance items and minor works which commonly arise in relation to heating, plumbing and drainage systems in schools.

A Water supply pipe (rising main) from mains or well supply.
B Cold water storage cistern.
C Overflow pipe.
D Central heating feed and expansion ("header") tank.
E Cold water distribution pipework.
F Heating system pipework.
G Sanitary appliances.
H Sinks (e.g. in classrooms or staff rooms).
I Central heating boilers.
J Radiators.

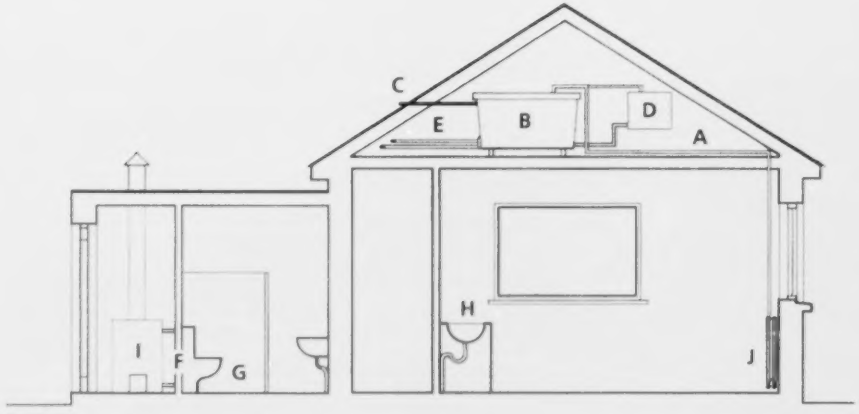


Figure 6-01. Typical elements of heating, plumbing and drainage systems.

Central Heating Systems - Common Problems

What goes wrong?	Why?	Matters for maintenance
Boiler breaks down or fails to deliver adequate heat	▼ Usually due to inadequate maintenance or servicing. Boiler might be undersized for heating load. Leaks on system at pipes and valves (sometimes in buried pipework) can also cause breakdown or unsatisfactory performance.	▼ Have boiler serviced at least twice annually - at start of "heating season" (usually October) and halfway through the heating season (January). A maintenance contract should be placed with a competent heating / plumbing contractor and suppliers of any 'compensator' controls. If a boiler has been frequently and well serviced, it should have a design life of 15 - 20 years before full or partial replacement. If the boiler is undersized consider: - Replacement or supplementing - Improving insulation of building fabric and heating pipework. - Reducing heat loss due to draughts. If boiler replacement is required, review other elements of the system, especially time clocks and thermostats. ▼ Check the heating installation regularly for leaks, especially at radiator valves.

Service boilers regularly **Check regulary for leaks**

Central Heating Systems - Common Problems (continued)

What goes wrong?	Why?	Matters for maintenance
Flooding in basement and below-ground boiler rooms	▼ Defective sump pump	▼ Have pump repaired and serviced as part of regular servicing of heating system.
Oil leaks	▼ Corrosion, damage, wear and tear in oil feed pipes and tanks.	▼ Have leaks repaired. Renew feed pipes or tank as necessary.
Gas leaks	▼ Corrosion, damage, wear and tear in pipe lines and at appliances.	▼ No smoking, naked flames or operation of electrical switches, appliances, or mobile phones. ▼ Open doors, windows and contact gas supply company. ▼ Check that appliances are turned off. ▼ If source of leak is not an unlit appliance, turn off gas at meter, evacuate building and contact gas supply company. If the gas supply company cannot be contacted, dial 999 and ask for Fire Brigade. Do not use a phone in the immediate vicinity of the leak. The Bord Gais emergency service number is 1850 20 50 50.

Check regularly for gas/oil leaks Always **adopt safe working procedures**

Central Heating Systems - Common Problems (continued)

What goes wrong?	Why?	Matters for maintenance
Fire hazard in boiler rooms	▼ Inappropriate use of boiler room as store for hazardous materials, e.g. paint, petrol.	▼ Ensure good housekeeping and safety practice in the management of the heating system and boiler room. Do not store materials in boiler rooms.

Do not use the boiler room for storage

Water supply and distribution - Problems

What goes wrong?	Why?	Matters for maintenance
Inadequate water supply	▼ Blocked nozzles in spray taps.	▼ Clean spray tap nozzles annually.
	▼ Poor mains pressure.	▼ Mains pressure problems are usually beyond the control of a Board of Management and require rectification by the local authority or group scheme. In older schools, the renewal of the rising main might improve pressure. In any event of poor mains pressure, seek expert advice.
	▼ Inadequate groundwater in systems supplied from wells; this can be intermittent, occurring in long dry spells.	▼ Where groundwater supply is inadequate, seek expert advice.

When in doubt seek expert advice

BEST COPY AVAILABLE

Water supply and distribution - Problems (continued)

What goes wrong?	Why?	Matters for maintenance
Inadequate water supply, continued.	▼ Defective pumps in systems supplied from wells.	▼ Have pump checked and serviced regularly (at least once a year).
Potability problems ▼ Water discoloured and/or contaminated.	▼ Pollution of mains supply.	▼ Pursue with local authority, group scheme or health board.
▼ High lead content in water.	▼ Water mains supplying older buildings can be through lead pipes.	▼ In the case of older buildings, have water tested for lead content and mains inspected to establish pipe material. Lead mains should be replaced by suitable alternative material such as PVC (plastic) or copper.
▼ Water discoloured, contaminated,	▼ Groundwater pollution in systems supplied from wells. This is often associated with unsatisfactory performance of septic tanks in the vicinity of the well.	▼ Have water supply from well tested annually for potability by the local health board. Any shortcomings should be redressed immediately. Septic tanks should be desludged at least once a year. In cases where pupil numbers have risen, the original septic tank may be undersized relative to the population served and may require more frequent desludging. If in doubt, seek expert advice. Groundwater pollution can also be caused by sources outside the school boundary.

Test private water supply annually

Desludge septic **tanks at least once a year**

Water supply and distribution - Problems (continued)

What goes wrong?	Why?	Matters for maintenance
Potability problems ▼ Water discoloured, contaminated, *(continued)*.	▼ Contamination of water in storage tanks.	▼ Empty and clean tank. Fit with an insulated cover which is not air-tight. (If tank sides are not insulated, provide insulation.)
Leaks	▼ Frost, wear and tear, physical damage.	▼ Have all leaks repaired promptly. Check areas not readily visible (e.g. roof spaces, cupboards) for leaks and bursts during "cold snaps". Old water cisterns that are leaking will probably require replacement rather than repair. New and replacement tanks should be plastic rather than metal, depending on location, and cylindrical rather than rectangular.

Check for leaks/bursts during and after cold weather — **Replace leaking tanks**

Water supply and distribution - Problems (continued)

What goes wrong?	Why?	Matters for maintenance
Leaks	▼ Wear and tear, physical damage.	▼ Repair leaks promptly. Where possible, incorporate features to avoid repetition; for example, if vandalism is an issue, consider concealed pipework and flushing cisterns. Avoid water wastage. Replace worn washers on taps.
Blockages	▼ Normal usage, abuse of appliances.	▼ Have blockages cleared. Assemble a basic "first aid kit" of plunger, drain-cleaning chemicals and drainage rods to facilitate clearing. Rigorously observe storage, usage and environmental precautions when using chemicals. Inappropriate use can cause injury, damage to drains, damage to sewage treatment installations and pollution.
Persistent smells from appliances	▼ Defective water seals in traps to appliances giving rise to siphonage and drain gases entering building through appliance.	▼ Loss of seal in appliances usually arises from defective design or construction and is not readily dealt with in routine maintenance. Seek expert advice.

Repair leaks, clean blockages promptly **When in doubt, seek expert advice**

Below ground drainage

What goes wrong?	Why?	Matters for maintenance
Blocked drains	▼ Back-up of material in drain.	▼ Occasional blockages can usually be cleared by conventional "rodding". Difficult-to-clear blockages may require power-assisted rodding or jetting; see your local classified directory for listings.
	▼ Subsidence or fracture of drain.	▼ Persistent recurrence of blockages usually arises from habitual abuse of system, vandalism or an inherent defect in the below ground pipework. In the latter case, seek appropriate expert advice.
	▼ Drain laid to inadequate fall (slope).	▼ Seek expert advice.

Clear blockages promptly When in doubt, **seek expert advice**

Septic Tanks

What goes wrong?	Why?	Matters for maintenance
Blockages	▼ See comments above regarding blockages in drains generally.	▼ See comments above regarding blockages in drains generally.
Smells	▼ Excessive volume of sludge in septic tank.	▼ Have tank desludged. Ideally, desludging should not occur during school hours. Observe rigorous safety procedures during desludging.
	▼ "Ponding" (flooding) of effluent in percolation area. This is usually an indicator of poor ground soakage.	▼ Where available, use reserve percolation area. Where ponding is persistent, have septic tank system assessed for suitability by appropriately qualified party.

Desludge septic tanks at least once a year **Always adopt safe working procedures**

Asbestos products associated with heating and plumbing installations

What goes wrong?	Why?	Matters for maintenance
▼ Asbestos products used in boiler houses as wall or ceiling lining or used as lagging (insulation) on boilers and pipework	▼ In some cases, the nature and age of the material can pose a health hazard warranting its removal.	▼ Seek specialist advice from the Health and Safety Authority or Forbairt

When in doubt, seek expert advice

7

Electrical Installations

Chapter 7

Electrical Installations

This chapter outlines recommended procedures for Boards of Management in relation to the maintenance and the improvement of the electrical installations within their schools.

The Basics

The typical electrical installations in a school will comprise the following components:

- Incoming ESB supply - rising main.
- ESB main switch and meter(s).
- Distribution board ("fuseboard" or "circuit board").
- Individual wiring circuits, typically divided into lighting, power (sockets) and, where applicable, storage heating. Some installations will include circuits for fire safety services, i.e. fire detection and alarm systems and escape lighting. Each circuit will be limited as to capacity by appropriately sized circuit breakers or (in older installations) fuses.

Defective or incorrectly used electrical installations are a safety and fire hazard!
MAINTAIN THEM ACCORDINGLY.

Electrical Installations (continued)

What goes wrong?	Why?	Matters for maintenance
Persistent breakdowns, fuses blowing, circuit breakers tripping.	▼ Faulty installation.	▼ Have assessed by appropriately qualified person.
	▼ Wear and tear, damage to wiring.	▼ Have assessed by appropriately qualified person.
	▼ Overloading of circuits (e.g. running appliances off lighting circuits).	▼ Have assessed by appropriately qualified person.
	▼ Inadequate supply; for example, the addition of storage heating may overload the capacity of the installation and necessitate a substantial upgrading of the system.	▼ Where demand exceeds capacity, upgrading works may be necessary.
Bad housekeeping practice.	▼ Carelessness, lack of appreciation of associated risks.	▼ Raise staff and pupil awareness of hazards associated with electricity. Have all electrical maintenance and minor works carried out by appropriately qualified persons. Have appropriate first aid procedures in place.

Electricity can kill - use it properly When in doubt, **seek expert advice**

BEST COPY AVAILABLE

Electrical Installations (continued)

What goes wrong?	Why?	Matters for maintenance
System becomes obsolete, outdated.	▼ Electrical installations have a limited functional life and require substantial replacement at the end of that period.	▼ All systems should be regularly inspected by a suitably qualified person. Where an electrical installation is more than 25 years old, it should be thoroughly surveyed and assessed by a competent person and its residual "life expectancy" determined. Where the installation is deemed obsolete or hazardous, immediate renewal should be under taken. Where a residual serviceable period exists, the installation should be regularly reassessed (at no more than two-yearly intervals).
Sundry defects in fire detection and alarm systems - most typically false alarms.	▼ Defects can arise from a variety of causes. Defective or damaged detectors are a common cause.	▼ Seek expert advice. In schools with a fire detection and alarm system, Boards of Management should have a maintenance contract with a competent contractor for the periodic inspection and testing of the system.

Electrical Installations - Common Problems

What goes wrong?	Why?	Matters for maintenance
Escape lighting defects.	▼ Defects can arise from a variety of causes. Defective power packs on light fittings are a common cause.	▼ Beyond the scope of routine maintenance. In schools with escape lighting, Boards of Management should have a maintenance contract with a competent contractor for the periodic inspection and testing of the system.
Defects in electrical components of heating system, e.g. pumps, thermostats, motorised valves and weather compensators.	▼ See chapter 6.	▼ See chapter 6.

Electricity can kill; use it properly When in doubt; **seek expert advice**

BEST COPY AVAILABLE

Maintenance Matters

Chapter 8

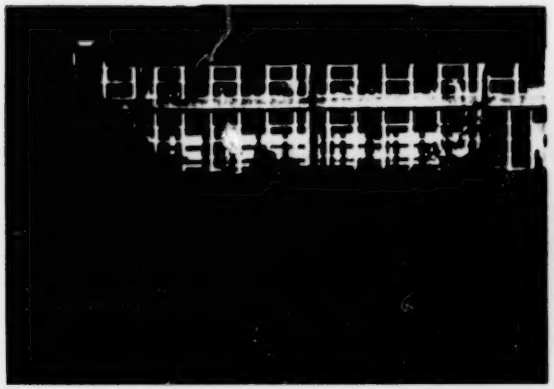
External Works (Paved & Grassed Surfaces)

Chapter 8

External Works (Paved and Grassed Surfaces)

External paving and grassed areas are subject to significant wear and tear, not just from the occupants of the school but from weathering. It is essential for paved and grassed areas to be in good condition. If paved areas are cracked or not level; they can constitute a trip hazard and a possible cause of injury. This is the most common source of accidents, injury and consequent litigation. It may lead to the increase of insurance costs. This chapter deals with the most common maintenance issues which arise in relation to external works.

The Basics



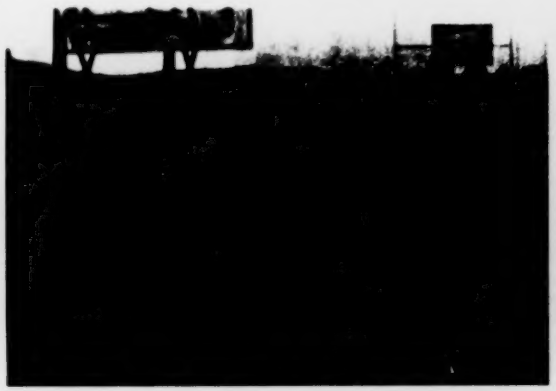


Figure 8-01 Typical external paving finishes

What goes wrong?	Why?	Matters for maintenance
Tarmacadam		
▼ Potholes within vested area.	▼ Potholes are caused by settlement of soil underneath the tarmacadam.	▼ Fill in potholes with tarmacadam and level the top surface. If excessive failure reoccurs, it may be necessary to seek advice.
▼ Cracking.	▼ Cracking can be caused by settlement of soil underneath the tarmacadam, and also because of poor quality materials or workmanship.	▼ Fill in cracks and level the top surface. If failure reoccurs, it may be necessary to seek advice.
	▼ Tree roots can cause cracking because of movement underneath the surface.	▼ Seek expert advice.
▼ Edge failure.	▼ Inadequate support for edges of tarmacadam areas, for example, at a junction with a grassed area.	▼ Provide properly bedded edging in the form of kerbs or similar. Local repairs to the areas of tarmacadam affected by the edge failure may also be necessary. Work should be carried out by personnel of appropriate expertise and competence.

Repair defects promptly **When in doubt, seek expert advice**

BEST COPY AVAILABLE

What goes wrong?	Why?	Matters for maintenance
Tarmacadam, continued ▼ General surface breakdown.	▼ Tarmacadam surface breakdown can be caused by: - Old age - Wear and tear - Oil/diesel spillage in car park areas	▼ Remove affected tarmacadam surface and replace completely.
Precast concrete paving slabs ▼ Cracking.	▼ Cracking can be caused by: - Settlement of bedding underneath - Joint between slabs too strong, no room for movement - Poor materials used - Slabs being laid and subject to traffic while "green" (i.e. before concrete has fully set)	▼ Remove cracked slabs. Replace with new ones. Ensure that slabs are laid on a firm level and a continuous bed of appropriate material (usually sand or a weak mix of sand and cement). If fault reoccurs, seek advice.

Repair defects promptly **When in doubt, seek expert advice**

What goes wrong?	Why?	Matters for maintenance
▼ Misalignment of slabs.	▼ Misalignment can be caused by: - Settlement of bedding material underneath - Poor workmanship in laying of slabs	▼ Remove the misaligned slabs, level bedding material underneath. Replace slabs and fill in joints between slabs. Uneven slabs are a very common cause of accidents. Watch very carefully. When fault occurs, deal with promptly.
Other pavings such as cobbles, setts and bricks		
▼ Cracking.	▼ Cracking can be caused by: - Settlement of bedding material underneath - Joint between slabs too strong; no room for movement - Poor materials used	▼ Remove cracked paving. Replace with new ones. Ensure that paving is laid on a firm level and a continuous bed of appropriate material (usually sand or a weak mix of sand and cement). If fault reoccurs a seek advice.
▼ Misalignment of paving.	▼ Misalignment can be caused by: - Settlement of bedding material underneath - Poor workmanship when laying the paving	▼ Remove the misaligned paving, level out bedding material underneath. Replace paving and fill in joints between paving.

Repair defects promptly **When in doubt, seek expert advice**

External Works (continued)

What goes wrong?	Why?	Matters for maintenance
Grassed Areas		
▼ Mud strips adjacent to the building.	▼ Inadequate drainage, rainwater running down the face of the building and collecting in the grass below.	▼ Clean face of building, removing any mud splashes. Remove a strip of grass around the perimeter of the building. Place a concrete apron or a paved area around.
▼ Flooding/ponding.	▼ Flooding or ponding can be caused by drains or gullies or other forms of drainage, such as septic tanks, becoming blocked.	▼ Check all drainage (drains and gullies) regularly. Ensure they do not become blocked. If they are blocked, clear them by rodding.
Chain link fencing		
▼ Rusting.	▼ Metal fencing exposed to the weather will rust if it is not properly protected.	▼ Remove badly rusted chainlink fencing. Replace with plastic-coated fencing.

Repair defects promptly **Check drains for blockages**

What goes wrong?	Why?	Matters for maintenance
▼ Concrete posts spalling.	▼ Spalling occurs because of reinforcement being too close to the surface or physical damage to posts.	▼ Repair or remove damaged posts. Where repair is not possible, posts should be replaced.
▼ Boundary wall, the copings on top of the walls become loose.	▼ Copings can come loose because of: - Poor mortar joint between the wall and coping - Wear and tear - Pupils climbing on top of the coping and dislodging it - Vandalism	▼ Rebed loose sections of coping on bed of mortar. Replace broken or missing sections of coping stone. In the case of constant damage to copings (for example, as a result of vandalism), an alternative coping design and fixing detail may have to be considered.

Repair defects promptly **When in doubt, seek expert advice**

Getting Work Done

Chapter 9

Chapter 9

Getting Work Done

Statutory Approvals, Tenders, Contracts, Tax Clearance

In undertaking any works to its school, the Board of Management should consider carefully the scale and complexity of the task. Works to the structure of the school, or to the mechanical and electrical systems should not be undertaken without engaging a properly-qualified professional adviser. If there is any doubt about the work being planned, professional advice should be sought.

The professional adviser can be engaged to plan the project, check on planning authority and fire officer requirements, health and safety issues and, where necessary, prepare tender documentation, invite tenders (quotations), and oversee the contract on behalf of the Board.

Planning Permission

Examples of works which might attract the requirement for an application for Planning Permission are:

- The placing of a prefabricated accommodation on a school site. Note that, in many cases, planning authorities limit planning permission for such accommodation to a specified time period (typically five years). Accordingly, Boards of Management may, on occasion, be required to renew or extend such planning permissions.

- Any extension of a school building.

- Any alteration which renders the external appearance of the school building inconsistent with the character of the building or of neighbouring structures. Clearly the status of this category of work is, to some degree, a matter of interpretation. Some alterations might, however, fall within its scope; for example, the external painting of a school building in a vivid colour, or the installation of replacement windows might be deemed to require planning permission. Where any doubt exists, the Board of Management should consult the local planning authority or take expert advice.

Fire Safety Certificates and Commencement Notices.

Building Control Regulations made under the Building Control Act state that the following works to school buildings are subject to the requirement for a Fire Safety Certificate:

- Extensions exceeding 25 square metres (269 square feet) in floor area.
- Material alterations to an existing school building.

A *'material alteration'* is an alteration which has implications for the structure or fire safety of the building.

Where any significant building work is proposed to a school building, it would be prudent for the Board of Management, if in doubt, to check with the local authority if the need for a Fire Safety Certificate arises. The making of a Fire Safety Certificate application requires the lodging of plans and other documents.

Where the need for a Fire Safety Certificate arises, a consequential obligation is that a Commencement Notice be served on the local authority by or on behalf of the Board of Management.

Appointing Consultants

In the case of some categories of maintenance and minor works, it may be necessary for the Board of Management to engage professional consultants such as an architect or a consulting engineer. It is not possible in a document such as this to clearly define the circumstances in which such engagement might be required. However, in any circumstances where the matters in question are clearly beyond the competence of the membership of the Board of Management or where any significant doubt exists as to an appropriate course of action, advice from a competent, suitably experienced and suitably qualified person should be sought.

Listings of members of the relevant professional bodies are available from:

The Royal Institute of the Architects of Ireland,
8 Merrion Square,
Dublin 2

Telephone: 01-6761703
Fax: 01-661 0948

The Institution of Engineers of Ireland,
22 Clyde Road,
Dublin 4

Telephone: 01-6684341
Fax: 01-668 5508

The Society of Chartered Surveyors,
5 Wilton Place,
Dublin 2

Telephone: 01-6765500
Fax: 01-676 1412

Listing of consultants are also included in local classified telephone directories

Consultants' fees are based on a percentage of the value of the works in question or on the time input involved. Professional scales of fees and rates of time charges are determined by the appropriate professional bodies, which may be consulted where any query arises. Professional consultants in private practice will normally be registered for VAT and have professional indemnity (P.I.) insurance cover.

Appointing Contractors.

In most cases the carrying out of maintenance or improvement works in and around school buildings will involve Boards of Management in engaging individuals or firms to carry out the works. In this commentary, such individuals or firms are referred to as "contractors", although they might not always be such in the precise sense of the word.

Some categories of works require greater levels of expertise and competence than others. For example, cleaning windows at ground floor level is a relatively simple and unskilled task, whereas servicing a central heating boiler requires a relatively high level of skill and experience. The level of expertise appropriate to the task should be borne in mind by Boards of Management when appointing contractors. See checklist below for more detailed commentary on the appointment of contractors.

Health and Safety

The Safety Health and Welfare at Work (Construction) Regulations of 1995 made under the Safety Health and Welfare and Work Act of 1989 impose obligations on promoters of building works. These obligations extend to a Board of Management undertaking maintenance or minor works on a school building.

The key points for Boards of Management to note regarding the Regulations are:

- Open and keep a Safety File for maintenance and minor works.
- Appoint competent person(s) as Project Supervisor (Design Stage) and Project Supervisor (Construction Stage). A single party, including a Board of Management, can act in both capacities if competent to do so.
- In the case of large-scale works or works involving particular risk (e.g. work with electrical installations, roof repairs) or where any doubt exists, Boards of Management are advised to appoint competent Project Supervisors. Advice on the assessment of the competence of Project Supervisors is available in guidelines from the Health and Safety Authority (HSA). The guidelines are available from the HSA and Government Publications.
- Competent contractors should have a written Safety Statement. Boards of Management should ask for a copy of contractors' Safety Statements before finalising tender lists or appointing of contractors.
- **If in doubt, seek expert advice.**
- **Always adopt safe working procedures.**

Appointing Contractors - Checklist

The following checklist summarises for Boards of Management the key points to be considered in getting work done.

- Assess the scope of the work and consider the need for professional advice. If in doubt, get such advice.
- Prepare appropriate documents for the works. This may vary from a simple, clearly stated written list to drawings and specification prepared by a professional adviser. At this stage, the Board should ensure that it is satisfied with the scope of the works proposed. Remember that changes during a contract can prove very expensive.
- Local authority, fire officer and health and safety requirements should be checked. Applications for planning permission and Fire Safety Certificate may be necessary.
- Seek at least three (more if possible) tenders (quotations) from competent contractors. Set a deadline for submission of tenders. If any contractor seeks and is given additional information about the contract, provide the same information to the other tendering contractors. If one contractor seeks additional time to quote, and the Board agrees, notify other contractors of the extension of time. Contractors should visit the school to assess the project themselves before submitting a tender; indicate suitable times for such visits in the tender documents, to avoid disruption of school activities.
- The Board may not use brand names in tender documents. Open all tenders on the date/time specified in the invitation to tender. Do not open tenders received after the specified deadline.
- Make sure that the contractor submitting the lowest tender has priced all the work. If he has not, adjustment of the tender price should not be allowed. If the price seems too low otherwise (compared with the other tenders), ask the contractor to justify the price. Ask the contractor to name other projects undertaken and check with the promoters of those projects on their outcome. If the answers are unsatisfactory, the contractor should be advised accordingly, and the next lowest quotation examined.
- If the nature and scale of the work involves the charging of VAT, check that the contractor is registered for VAT.
- Check that the contractor to be awarded the contract has a valid Tax Clearance Certificate. A letter from the tax office will not suffice. Do not engage any contractor without such a Certificate. Insist that the Certificate be kept in force for the duration of the contract.

- Check that the contractor's insurances are in order. If necessary, have them checked by the Board of Management insurance advisers.

- A valid contract requires an offer (from the contractor), an acceptance (from the school), a consideration (price), and consensus between the parties on all matters relating to the contract. Make sure there is no ambiguity.

- Treat all contractors fairly and impartially.

- The letter of acceptance to the contractor should set out clearly what is expected in terms of start date, completion date, and the timing of payments for the work.

- Notify unsuccessful contractors promptly.

- Monitor progress of the contract and notify the contractor, in writing, of any difficulties.

- Insist that the contractor corrects any problems that arise within a contract guarantee period.

- Keep a record of details of the tenders, and the awarded contract, for five years.

Special Note on Window Replacement Contracts

Products of window manufacturers can vary significantly in terms of materials, gauge, security arrangements etc. Consequently, it is difficult to compare like with like in a tender situation. Where a Board of Management is replacing windows, it should first ask prospective contractors to provide a sample of the window, supporting technical details, and also supply information on other locations where the window has been installed. The Board should satisfy itself in relation to the information supplied and then invite tenders, but only from contractors capable of supplying and installing windows considered suitable for the school.

10

Furniture & Loose Equipment

Chapter 10

Furniture and Loose Equipment

In addition to expenditure on the structure and fabric of their schools, the Minor Works Grant Scheme empowers Boards of Management to purchase items of furniture and P.E. equipment. This chapter deals with the key issues arising in respect of the purchase of such items, as well as their maintenance and repair.

Furniture and loose equipment

Acquiring furniture and equipment

Points to note

Standard specifications for Primary School Furniture are available from the Building Unit of the Department of Education and Science. Any furniture or equipment (including fixtures such as chalkboards and noticeboards) should conform with those specifications. Items covered by the specifications include:

- pupils' tables and chairs
- cupboards, including cupboards with display and cupboards with shelving
- bookcases
- book trolleys
- paper cabinets
- storage bins
- chalkboards and display boards
- pedestals
- bookshelves

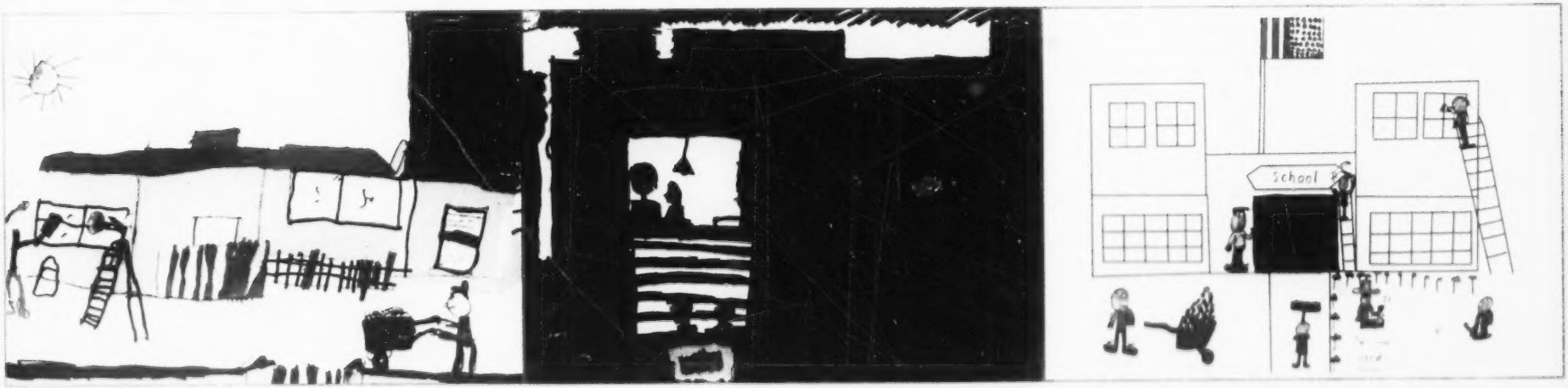
The Department also publishes detailed information on the approved range of furniture and equipment. All furniture purchased should conform with that information.

Furniture and loose equipment

When inviting tenders for furniture and/or equipment, note the following:

- The general advice given at chapter 9 - **Getting Work Done**.
- Insist on itemised prices.
- Tenders should include for delivery and, where appropriate, assembly and/or fixing/erection.
- A standard certificate and undertaking by the supplier/contractor is required prior to payment. See standard specifications referred to above for full details.

Any repairs to damaged furniture should be carried out by a competent party. This is particularly so in the case of P.E. equipment. If in doubt, consult the original supplier/contractor.



Appendix, Glossary, Index

(Circular 3/96)

Appendix

Department of Education Circular 3/96

New Grants Scheme for Minor Works to National Schools

1. The New Scheme

The Minister for Education is pleased to announce the introduction of a new grant scheme for minor works to national school properties. This initiative is in keeping with the **White Paper** statement that **"implementation of smaller projects and building maintenance...will be devolved to the relevant education board or school as appropriate"**.

The new scheme will begin in January 1997 with the transfer of funds to all primary schools on the following basis:

- **£2,000 basic grant plus £9 per pupil** (on rolls on 30 September 1996)
- The grant will be paid on an annual basis thereafter.

In future, schools should not apply to the Department for grant-aid for works costing less than £5,000, or twice the annual allocation, whichever figure is higher.

2. Works covered under the scheme

The funds being transferred to the schools are designated as capital and *must be spent on new facilities, or improvements to existing facilities.* The facilities in question are:

- school buildings and grounds
- mechanical and electrical services
- furniture and physical education equipment
- floor coverings and window blinds

Schools need not apply to the Department for approval to carry out works covered by the scheme.

3. Works not covered under the scheme

3.1 School Maintenance and Repair

The funds must not be used for any maintenance works to the school facilities. Items such as repairs, painting and decorating should continue to be funded from the capitation grant.

3.2 Additional Classrooms

All proposals relating to the provision of additional classroom accommodation should continue to be referred to the Department for approval.

4. Capital Account

The funds transferred by the Department under this scheme must be held by each school in a separate, clearly identifiable capital account controlled by the Board of Management.

In December 1998, and every three years thereafter, each school must provide the Department with a written statement of the sum held in the account.
In the event that a school ceases operation, any balance held in the account must be surrendered to the Department.

5. Local Contribution

Schools are not required to make a local contribution towards the cost of works covered by the scheme. However, schools must continue to provide a local contribution for other projects being grant-aided by the Department. Such local contribution cannot be taken from the new capital account.

6. Vested Area

The funds should be expended only on works to facilities which are within the vested school area.

7. Authority/Responsibility

The new scheme devolves authority to Boards of Management for the execution of minor works. Responsibility for the proper execution of works will also rest with the Boards of Management.

8. Execution of Works

Schools must organise the execution of the works covered under the scheme, and pay the bills themselves.
The Department will prepare and issue a booklet to assist schools in relation to the procedures for the execution of works.

9. Schools housed in rented accommodation

Where works are required to schools housed in rented accommodation, Boards of Management should ensure that they adhere to the terms of the lease in undertaking such works.

10. Administrative Issues

- Records/Auditing

  The capital account may be audited by the Department, so full records, including invoices and receipts, must be kept by the school for a period of five years.

- Withdrawal of Circular 18/91

  This Circular supersedes Circular 18/91, which is hereby withdrawn.

- Withdrawal of existing grant sanctions

  Grant sanctions for works covered by this scheme, and which pre-date 31 December 1994, are hereby withdrawn. The withdrawal does not apply to cases where works are already in progress.

11. Review

The operation of the new scheme will be reviewed after two years.

Seán Ó Briain
Assistant Secretary

May 1996.

Glossary

Alkalinity: A measure of the chemical nature of a material. The opposite to acidity.

Cavity: In a cavity wall, the space between the inner and the outer leaves of masonry.

Concrete fillets: A sloped wedge of concrete sometimes used instead of metal flashings, especially at chimney-to-roof junctions.

Copings: A brick, stone or concrete capping for weathering the top of a wall, chimney or similar element.

Door closers: A device attached to a door so that when the door is left in the open position, it will automatically close.

Door thresholds: A horizontal element at the foot of an outside door, provided to prevent draughts and blown rain passing under the door.

Downpipes: Rainwater pipes.

DPC *(Damp proof course)*: A horizontal layer of impervious material built into walls and chimneys to exclude moisture and dampness.

DPM *(Damp proof membrane)*: A layer of impervious material laid under a floor to prevent rising dampness.

Eaves: The lowest, overhanging part of a sloping roof.

Fascia board: A wide board set vertically on edge, fixed to the horizontal edges of a roof. It carries the gutter around the eaves.

Flashings: Strips of impervious material, usually flexible metal (such as lead), which exclude water from the junction between a roof covering and another surface (usually vertical). Flashings, at their upper end, are usually wedged tightly into mortar joints which have been raked out to receive them.

Glazing beads: A small hardwood strip, used instead of putty to retain glass in a window frame.

Glazing compound: A bedding material into which the glazing bead is set.

Gutter: A channel along the edge of an eaves to remove rainwater. Usually connects to downpipe.

Intumescent strip: Narrow strip of material bedded into the top and sides of a fire door. In fire conditions, the material swells to hold the door in the frame and restrict fire and smoke spreading through the door opening.

Linoleum (lino): A floor covering built up from linseed oil and hessian canvas.

Mastic: A permanently plastic waterproof material, which hardens on the surface so that it can be painted. It is used for bedding roof lights, window frames, sealing joints in gutters, flashings etc. Gun mastics are applied to window glazing with a pressure gun, which lays it on very quickly and cleanly.

Mortar droppings: Splashes of mortar arising from the process of building brick or block walls.

PVC sheeting and tiles: A rubbery almost non-combustible material.

Radon: A natural radioactive gas that has no taste, smell or colour. It is found to some degree in all soils and rocks. It is formed in the ground by the radioactive decay of small amounts of radium. See chapter 3.

Reflective coating: A paint, usually white or silver, which reflects the ultra violet rays of the sun, and reduces heating of roof surfaces. Common on flat roofs.

Sealants: Materials used to fill and seal surface of a joint to prevent water and grit entering. It is usually applied, like mastic, with a pressure gun.

Soffit board: A horizontal board nailed to the underside of rafters, forming a soffit under an overhanging eaves.

Spalling: If reinforcement within a concrete elements is too close to the surface, the effects of frost and moisture can cause the layer of concrete covering the steel to "blow" off, exposing the steel. This process is called spalling.

Structural elements: The parts of a building which carry load in addition to their own weight, as opposed to elements which only carry their own weight. Structural elements include walls, floors and roofs.

Vinyl: Flexible plastic used, in tile and sheet form, as a floor covering.

Weatherboarding: Timber boards nailed (usually horizontally) on the outside of buildings.

Weephole: (a) A small hole in a timber sill which allows condensation water to escape outwards. (b) a small gap in a cavity wall to allow water to drain out of the cavity.

Index

A

Alarm systems 7-03
Appointing consultants 9-02
Appointing contractors 9-03
Asbestos 2-11, 5-10, 6-09

B

Birds nesting 2-09
Boiler rooms 6-03
Boiler rooms
fire hazard 6-04
Boundary wall 8-06

C

Carpets 5-08
Carpets
care 5-09
stains 5-08
Chain link fencing 8-05
Circuit board 7-01
Cobbles 8-04
Commencement notices 9-02
Condensation 3-10, 4-06

D

Doors 4-01
Doors
broken glass 4-03
damp penetration 4-02
draughts 4-04
fungal decay 4-02
jamming 4-03
leaks 4-02
replacement 4-05
DPC 3-03
DPM
Drainage 6-01
Drainage
blockages 6-07
smells 6-07
Draughts 4-04
Dry Rot 2-07, 3-07, 4-02
Dust control mopping 5-04

E

ESB 7-01
ESB
main switch 7-01
supply 7-01
Electrical installation 7-01
Electrical installation
breakdowns 7-02
Escape lighting 7-04
External finishes 5-01
External finishes
blistering 5-02
cracking 5-02
fading 5-03
pattern staining 5-03
peeling 5-02
rusting 5-03
External works 8-01
External works
edge failure 8-02
misalignment 8-04
potholes 8-02
surface breakdown 8-03

F

Fire alarm 7-03
Fire detection 7-03
Fire doors 4-05
Fire doors
closers 4-05
intumescent strips 4-05
smoke seals 4-05
Fire Safety Certificates 9-02
Flashings
Flat 2-01
Flat roof 2-02
Floor finishes 3-10
Floors 3-01
Floors
cracking 3-02
DPC 3-03
DPM 3-05
dry rot 3-07
frost action 3-08
leaks 3-03
mastic seals 3-04
penetrating dampness 3-02
spalling 3-08
wet rot 3-07
Fungicide 3-09, 4-02
Fuseboard 7-01

G

Gas leaks 6-03
Graffiti 5-09
Grants Scheme 1-01, App-01
Grassed areas 8-05
Grassed areas
ponding 8-05
Grassed surfaces 8-01

H

Health and safety 9-03
Heating 6-01
Heating
boiler breakdown 6-02

I

Improvement works 1-06
Internal finishes 5-01
Internal finishes
blistering 5-02
cracking 5-02
fading 5-03
patterning staining 5-03
peeling 5-02
rusting 5-03
Ironmongery 4-06
Ivy growth 3-08

L

Leaks 2-03, 3-03, 3-10, 4-02, 6-06
Lichen growth 3-08
Linoleum 5-04

M

Maintenance 1-02
Maintenance
aims 1-05
definition 1-02
planned 1-04
priorities 1-05
unplanned 1-04
Mould growth 3-08

O

Oil leaks 6-03

P

Paintwork 5-02
Paved surfaces 8-01
Paving slabs 8-03
Pitched roof 2-02
Planning permission 9-01
Plumbing 6-01
Prefabricated accommodation 2-11, 3-11, 4-06, 5-10

R

Radon gas 3-12
Rising dampness 3-04
Roof covering 2-04
Roofs 2-01
Roofs
- *blistering* 2-06, 5-03
- *condensation* 2-05, 2-10
- *design life* 2-04
- *flashing* 2-02
- *foot traffic* 2-03
- *gutters* 2-03
- *insulation* 2-50
- *leaks* 2-02
- *plumbing leaks* 2-05
- *ponding* 2-06
- *rain water outlet* 2-03
- *reflective paint* 2-04
- *sand/cement fillets* 2-03
- *slates* 2-02, 2-03
- *snow* 2-03
- *solar heat gain* 2-04
- *theft* 2-02
- *tiles* 2-02, 2-03
- *ultra violet-degradation* 2-04
- *ventilation* 2-10
- *woodworm* 2-08

S

Safety file 9-04
Sagging roofs 2-09
Septic tanks 6-09
Septic tanks
- *percolation area* 6-09
- *ponding* 6-09
- *smells* 6-09

Setts 8-04
Slabs 8-04
Solar protection 2-04

T

Tarmacadam 8-02

V

Vermin nesting 2-09
Vinyl 5-04

W

Walls 3-01
Walls
- *cavity trays* 3-04
- *cracking* 3-02
- *DMP* 3-05
- *DPC* 3-03
- *dry rot* 3-07
- *frost action* 3-08
- *leaks* 3-03
- *mastic seals* 3-04
- *penetrating dampness* 3-02
- *spalling* 3-08
- *wet rot* 3-07

Wasps nesting 2-09
Water distribution 6-04
Water supply 6-04
Water supply
- *leaks* 6-06
- *mains pressure* 6-04
- *potability* 6-05

Wet Rot 2-08, 3-07, 4-02
Windows 4-01
Windows
- *broken glass* 4-03
- *damp penetration* 4-02
- *dirty* 4-04
- *draughts* 4-04
- *fungal decay* 4-02
- *jamming* 4-03
- *leaks* 4-02
- *putty missing* 4-04
- *replacement* 4-05

Woodworm 2-08

Maintenance Checklists

Maintenance Checklists

The following is a series of checklists of items for periodic inspection as part of a systematic planned maintenance regime for primary schools. Boards of Management are urged to adopt these checklists as a model, modifying them appropriately to their individual school.

The master checklists are divided into five categories (daily, weekly, six-monthly, annual and 5-to-7 yearly.) Boards of Management are exhorted to copy these lists and use them as a basis for maintenance inspections and activities, modifying them as necessary to suit their individual school premises. Use of these forms will assist in the development of a positive 'maintenance mentality' and allow for systematic management of the maintenance function.

Also included in this section is a master maintenance "To Do" list, which should be copied and used to record items requiring action noted during routine inspection.

Boards of Management should open and maintain a separate Maintenance File in which should be retained copies of all completed checklists, the master maintenance "To Do" list , and copies of documents relating to the school and its equipment (e.g. "as built" drawings, equipment manuals and documents relating to any works carried on). It should be available for periodic inspection by staff of the Department of Education and Science.

Maintenance Checklists

Daily Maintenance Checklist Date:	Done		Comments
	Initials	Date	
▼ Vacuum carpets in heavily trafficked areas, such as lobbies and corridors, with a rotary brush vacuum cleaner.			
▼ Clean linoleum and vinyl flooring with a dust control mop.			
▼ Check toilets, urinals, handbasins for blockages and leaks.			
▼ Check heating system systems during heating seasons. Adjust, as necessary, to suit prevailing weather conditions.			
▼ Check pipes in roof void during cold spells.			
▼ Update Master maintenance "To Do" sheet as necessary. Add new items requiring action. "Sign Off" any actions completed today.			

Maintenance Checklists

Weekly Maintenance Checklist — Week Ending Friday:	Done		Comments
	Initials	Date	
▼ Vacuum carpets not vacuumed daily (i.e. in less heavily trafficked areas, such as classrooms and staffrooms) using a rotary brush vacuum cleaner.			
▼ Wash handbasins and sinks.			
▼ Clean toilets and urinals.			
▼ Check heating oil levels during the heating season.			
▼ Cut grass during the growing season.			
▼ Maintain shrubs and flowerbeds during the growing season.			
▼ Carry out general "walk around" inspection of school and grounds. Note any items requiring action.			
▼ Update Master maintenance "To Do" sheet as necessary. Add new items requiring action. "Sign Off" any actions completed today.			

Six-Monthly Maintenance Checklist Date:	Done		Comments
	Initials	Date	
▼ Clean gutters.			
▼ Check rainwater outlets on flat roofs.			
▼ Clean rainwater downpipes.			
▼ Check ironmongery.			
▼ Clean windows.			
▼ Clean blinds.			
▼ Check all tables and chairs for damage to legs or tops, and repair, if necessary.			
▼ Check all school furniture for damage to castors, shelves, tops.			
▼ Scrub linoleum or vinyl flooring and reapply recommended protected covering.			
▼ Check external paving surfaces; replace or repair any damage immediately.			
▼ Check all gullies, access junctions and manholes for blockages.			
▼ Check septic tank, where present. If necessary, have tank desludged, preferably not during school hours. Desludging should be carried out by a competent contractor and rigorous safety procedures followed.			
▼ Cut hedges at start and end of growing season.			
▼ Check all toilet roll holders, towel rails, soap dispensers.			
▼ Check for vermin and deal with appropriately.			
▼ Update Master maintenance "To Do" sheet as necessary. Add new items requiring actions. "Sign Off" any actions completed today.			

Annual Maintenance Checklist (Page 1 of 2) Date:	Done		Comments
	Initials	Date	
▼ Check roof for slipped or broken or missing slates or tiles.			
▼ Check the roof for defective flashing.			
▼ Check the operation of ball valves in water tanks in the roof void.			
▼ Check all accessible timbers for signs of dry rot - dampness, mould or fungus growth.			
▼ Check all external timbers for signs of decay - wet rot.			
▼ Check all accessible timbers for signs of woodworm.			
▼ Areas affected with condensation should be treated with a fungicidal wash.			
▼ Check surrounds to window and door frames for signs of dampness.			
▼ Check timber/concrete floors for signs of dampness and staining on walls.			
▼ Control climbing plants; keep away from window and door frames and down from eaves level.			
▼ Check the putty in doors and windows.			
▼ Clean carpets with high performance hot water extraction equipment.			
▼ Have septic tank desludged.			

Annual Maintenance Checklist (Page 2 of 2) Date:	Done		Comments
	Initials	Date	
▼ Check all electrical appliances, e.g. radios, overhead projectors, photocopiers, hand-driers. If in doubt, have inspected by suitably qualified person.			
▼ Check cloakroom fixtures: rails, benches, hanging fixtures. Repair/renew damage or defects as appropriate.			
▼ Check any trees on school grounds for problems with overhanging branches or threat to power lines.			
▼ Repair/replace as appropriate damaged or lifting tiles or floor coverings.			
▼ Check goalposts, crossbars, basketball nets, backboards and roofs. and all other major items of P.E. and sports equipment.			
▼ Check door closers and adjust if necessary.			
▼ Renew chalkboard surfaces.			
▼ Check all boundary walls, hedges, fences for damage or breaks and repair as necessary.			
▼ Update Master maintenance "To Do" sheet as necessary. Add new items requiring action. "Sign Off" any actions completed.			

Maintenance Checklists

Every 5 - 7 Years Maintenance Checklist Date:	Done		Comments
	Initials	Date	
▼ Painting Internally and externally			
▼ Update Master maintenance "To Do" sheet as necessary. Add new items requiring actions. "Sign Off" any actions completed.			